

EMERGENCY RESTORATION OF
BROADBAND CARRIER SYSTEMS

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<u>1. GENERAL</u>	
1.01 This section covers methods and procedures to be followed in establish- ing emergency restoration of circuit groups of broadband carrier systems following a facility failure. This section deals with the establishment of predetermined restoration plans, control responsibilities and the activation of such plans under emergency conditions.	
1.02 This issue replaces Section E24.950.000 Issue C. Since this reissue presents a general revision and rearrangement of material, asterisks ordinarily used to in- dicate changes have been omitted.	

- 1.03 This section does not deal with the physical restoration of the broadband facility, such as radio system, cable pairs or coaxial tubes. These procedures are covered in other practices.
- 1.04 The number assignments to be used for Associated Sections are as follows:
- 002-503-900 LL Emergency Restoration of Broadband Carrier Systems.
 - 002-503-920 LL General Section - For Long Lines use in Eastern Area.
 - 002-503-921 LL to 929 LL For Eastern Area miscellaneous use.
 - 002-503-930 LL General Section - For Long Lines use in Central Area.
 - 002-503-931 LL to 939 LL For Central Area miscellaneous use.
 - 002-503-940 LL General Section - For Long Lines use in Western Area.
 - 002-503-941 LL to 949 LL For Western Area miscellaneous use.
 - 002-503-950 LL General Section - For Long Lines use in Southeastern Area
 - 002-503-951 LL to 959 LL For Southeastern Area miscellaneous use.

2. DEFINITIONS

- 2.01 Division Restoration Coordinator - A person or group, appointed within a Division to head-up and direct the restoration plans for that Division.
- 2.02 Restoration Control Office (RCO) - An organization which directs an overall broadband restoration plan. A restoration control office is generally a testroom location which controls the restoration plans for a specific geographical territory within a Division or Area.

2.03 Restoration Sub-Control Office - Is a testroom location which may be designated by the restoration plans to test a portion of the restoration reroute. Such portion is generally confined to independent radio relay or L carrier sections which are used as part of the make good facility.

2.04 Junction Office - Is any location which performs planned functions initiated by the Restoration Control Office. A Junction Office can be any radio relay point, coaxial office, the restoration control office, or any other location involved in terminating or patching through high frequency lines by either manual patches or remotely controlled switches, in establishing planned reroutes.

2.05 Restoration Plan (RCO) - Is a planned facility layout identified by a number, used to restore a designated facility section lost by a failure. Circumstances present at the time of failure may alter any pre-determined restoration plan, however, such changes will be made as necessary only on a verbal basis and under the direction of the Restoration Control Office.

2.06 Office Plan - Is a detailed patching, switching or other instruction used by a Junction Office in establishing a restoration plan.

2.07 Notification Flow Chart - Is a prescribed sequence of notification to insure that all Junction Offices involved in establishing or discontinuing a restoration plan are notified.

2.08 The L Carrier Section - Is the overall pilot section in both directions of transmission between two terminal main stations equipped with Type L Carrier System equipment. The high frequency line of the section can be comprised of either coaxial cable and/or radio relay channel facilities. Coaxial cable line facilities are made up of L Units, and the Radio Relay channel facilities are made up of R Units. Either type of high frequency line will consist of one or more units in tandem.

3. RESTORATION CONSIDERATIONS

3.01 When facility failures occur, the control office of circuits and services which are affected, are seldom coterminal with the facility section where the failure

occurs. If each circuit control office attempts to discharge restoration responsibilities, efforts will overlap, confusion results and restoration is delayed. The purpose of restoration plans and a Restoration Control Office is to avoid such a condition and to execute and supervise restoration plans in an orderly manner for failures which occur.

3.02 Restoration should be completed on a single facility failure in 10 minutes or less. Facility restorations should be completed on a multi-facility or total route failure at 10 minute intervals or less. These are the maximum allowable time intervals and every effort must be made to reduce the time to an absolute minimum.

3.03 Restoration plans should be developed for each broadband facility, using protection channels or any other available facility to restore up to a complete route failure. Wherever possible restoration should be accomplished by making good a failed facility on an alternate compatible facility. If small units of circuits are involved, such as may drop at an intermediate point, they should generally be made good after the bulk restoration has been completed.

3.04 An all-out effort should be made to restore service on any broadband failure regardless of the length or complexity of the restoration layout.

3.05 While the written restoration plans are based on utilization of protection channels or other available idle facilities, the use of TV lines should be considered for additional made goods. Often, spare or idle TV channels are available or TV service may be rerouted to make a facility available for restoration purposes. On attempting a reroute over considerable distance, the use of a released TV facility provides the quickest continuity between two points.

3.06 When a complete restoration of a failed section is not possible, such as a multi-line L3 failure, the most advantageous assignment of master groups must be made. A priority list should be compiled in accordance with Paragraph 7.01 of this section. When the first reroute becomes available it should be immediately used to restore the first order of priority service if possible. If this is not possible the reroute should be used immediately to restore service on a lower priority line.

3.07 In cases of type K carrier failures, consideration should be given to using L carrier or radio relay facilities to establish temporary layouts. The possibility of using slots in existing L carrier layouts should not be overlooked.

3.08 When making good an L1 system over an L3 mastergroup, certain supergroups will be lost due to frequency considerations. The restoration plans covering such a make good should consider means to restore the lost supergroups on other facilities.

3.09 In cases of an L3 coaxial failure, it may be desirable to restore all master groups in one direction over a TD-2 radio channel when transmission conditions permit. The amount of roll-off on a TD-2 channel, which increases with length, will limit the number of master groups that can be worked on one channel without severely degrading all circuits. The following is a guide for the restoration of master groups as related to channel reroute mileage:

<u>MG Position</u>	<u>Satisfactory</u>	<u>Possible Operation</u>
MG 1-3	Not to exceed 300 mi.	300-500 mi.
MG 1-2*	Not to exceed 500 mi.	500-1000 mi.

* MG3 of a 3MG system to be restored on a separate facility.

3.10 A TH radio channel may be used to restore an L3 system with no limitation on the length of the radio channel. If TD2 and L3 or TH channels are connected in tandem, the TD2 mileage limitations of paragraph 3.09 apply to the TD2 portion of the reroute.

3.11 Before establishing restoration plans for any reroute where the operation is questionable, an actual test should be made to determine the route capability.

3.12 In order to assist the Restoration Control Office to expedite a restoration plan that involves a number of Junction Offices, it is necessary to delegate evenly the responsibility of notification among a limited number of offices involved.

3.13 All personnel, regardless of departmental jurisdiction, should be efficiently used where necessary to establish the desired reroute. Office supervision must be promptly

notified if not already aware of a restoration requirement. Progress of restoration reroutes should be closely supervised. A Restoration Control Office should not hesitate to call for an additional or alternate plan, if in its opinion, restoration is not progressing as expected. All points in the notification chain must remain on the Restoration communications network until released by the Restoration Control Office.

3.14 When it becomes necessary to establish a restoration plan or plans, the following terminology should be used when notifying other offices in the notification flow chart; "ESTABLISH RESTORATION PLAN", followed by the plan identification of the restoration plan or plans to be established. The offices and the persons receiving and transmitting the message should be identified and logged. The restoration plan reroute should be established in both directions of transmission unless specifically mentioned otherwise.

3.15 The Restoration Plan must incorporate instructions that the transmitting terminal of the reroute should send a test tone of 1056 KC over the reroute. The receiving office of the reroute will measure this tone to determine whether transmission will be satisfactory for service before switching service to the reroute.

3.16 While it is important to establish restoration plans as quickly as possible, it is equally important that facilities utilized for such restorations be released promptly when they are no longer required. Restoration plans, therefore, should include both the establishment and the release of the facilities.

4. RESTORATION PLAN NUMBERING

4.01 The assignment of plan numbers to the various areas are as follows:

1 - 400 For Pacific Telephone and Telegraph Company use

401 - 999 For Long Lines use

4.02 An alphabetical prefix must be used with the number assignments to identify the Restoration Control Office originating the plan. This will permit the same number to be used at other locations.

4.03 The alphabetical prefixes used by Restoration Control Offices are listed in Attachment 1. Prefixes for additional offices will be assigned as required by the Plant Operating Engineer.

4.04 If desired, the Restoration Control Office may expand the numbering arrangement by using a scheme of suffix numbers or letters to identify the choice of the reroute or the order of priority.

5. RESTORATION PLAN FORMAT

5.01 Restoration plan drawings should be prepared on standard 8-1/2 by 11 inch page size paper. Each plan should contain only the information necessary to establish the make good reroute of a designated facility failure. Attachment 2, Examples A, B, C and D of this section are typical examples of restoration plan drawings of L type facility failures.

5.02 The following nomenclature and symbols should be used in the preparation of restoration plans.

(a) IF - denotes the manual connection of two protection channels at a radio relay junction office and includes the necessary protection lockout operations at that office.

(b) IF SW (office) - denotes that 2 radio relay protection channels can be interconnected remotely by the office shown in parenthesis and includes the necessary protection lock-out operations at that junction point. At some locations this may mean only protection lock-out in both directions.

(c) TD-L - denotes connecting of a TD2 radio relay channel and L-1 coaxial facility, or one master group of L-3 to a radio relay channel.

(d) TD-L3 - denotes connecting of a TD2 radio relay channel and L-3 coaxial facility (3 Mastergroups).

(e) TH-L3 - denotes connecting of a TH radio relay channel and L-3 coaxial facility (3 Mastergroups)

(f) TD-TH - denotes connecting of a TD2 radio relay channel and a TH radio relay channel at baseband by the use of FM terminal equipment on both channels.

(g) HF - denotes coaxial facilities connected in tandem or connected to high frequency terminal equipment. Also denotes patches at MUR terminals at L carrier frequencies. This should also include the necessary protection lock-out operations at that office.

(h) PROT. LO #(Office) - denotes lock-out of protection channel in a particular direction when required to release the protection channel for patching at an intermediate auxiliary microwave station. A note shall be placed on the plan indicating direction by the use of the symbol #. This will be required when patching is performed in the middle of a switching section.

(i) Show the complete route of the "L" Section with Junction Offices inside circles of 3/4 inch diameter. Above line show "REG". (Regular layout of the L section route).

(j) Show patching terminals as square boxes with inscribed circle.

(k) Show the reroute layout between the square boxes.

(l) L1 carrier facilities should be shown with a single solid line.

(m) TD2 Regular Radio relay facilities should be shown with a single broken line.

(n) TD2 interstitial radio relay facilities should be shown with a single broken line with an "I" above every 5th segment.

(o) TH radio relay facilities should be shown with a double broken line.

(p) L3 carrier facilities should be shown with a double solid line.

(q) TV facilities should be shown with a single dot dash line.

(r) An "X" associated with a facility indicates the point of failure.

(s) An Asterisk "*" shown by the office name indicates the office is not normally manned, and the particular restoration function required at that point will necessitate dispatching a qualified man.

5.03 Maps of radio relay and coaxial cable routes are published by Headquarters' Engineering on a recurring basis as changes occur in the facility layouts. Direct distribution of these maps will be made to all Restoration Control Offices to assist them in keeping current records of broadband facilities. The maps are titled:

- (1) Assignment of Coaxials - Long Lines and Associated Companies
- (2) Radio Relay Channels - TD - Main Routes
- (3) Radio Relay Channels - TH - Main Routes

5.04 The notification chart on the plan should be used to inform all points to establish or retire a restoration plan. In order to expedite restoration, an office should not be expected to notify more than four points. The notification flow chart should start with the office designated as the Restoration Control Office. The two Junction Offices at the terminals of the reroute should be notified directly by the Restoration Control Office to permit the rapid exchange of information regarding continuity, levels, etc. Junction offices, not in the territory of the Restoration Control Office may be notified through their own Restoration Control Office. The individual restoration plan must be considered in the light of several other plans that must be activated at the time of a route failure. The adjacent Restoration Control Office to the route failure may be involved in at least one of the several plans and, therefore, his assistance should be used for notification of all points within his territory.

5.05 All restoration plans must be numbered so as to group all plans for a given route within a small block of numbers to assist in filing and locating a specific plan.

For example on a route consisting of 3 regular lines plus one protection, 7 plans would be required. Plans 1 to 3 would show making good any one of the 3 regular lines over the same reroute, i.e., the shortest, easiest to establish route. Plans 4 to 6 would show making good any one of the 3 regular lines over the second easiest reroute. Plan 7 would show the lowest priority of the 3 regular lines over the third easiest reroute. Plans 1 to 3: 1st choice for single line failures. Plans 4 to 6: Alternate for single line failures. Plans 1, 5 and 7: Total route failure. Three additional plans can be set up where possible as alternates for total route failure plans.

This has an added advantage of meeting priority requirements if the highest priority line is assigned to Plan 1, the 2nd priority to Plan 5 and the 3rd priority to Plan 7.

If sufficient facilities are not available to completely restore a total route, it is the responsibility of the Restoration Control Office to so advise higher management thru normal lines of organization.

6. OFFICE PLAN FORMAT

6.01 The office plan may be a sketch and/or a written instruction. It must be in such detail that it will permit anyone to establish the plan.

6.02 An office plan must be prepared in advance for each restoration plan involving the office and must be written on the back of or attached to the restoration plan. Attachment 3, Examples A and B are typical office plans.

7. RESPONSIBILITIES

7.01 The Division Restoration Coordinator should work closely with the New York Status Center, Traffic Circuit Supervisor, Restoration Control and Subcontrol Offices and similar groups in other Divisions responsible for developing restoration plans. The Division Restoration Coordinator will:

- (a) Coordinate overall Division restoration plans.
- (b) Formulate inter-Division plans with other Divisions.
- (c) Designate at least one Restoration Control office for each Division. Where it is desirable for the Restoration Control Office to direct the restoration plans for a larger geographical territory the Area Office may designate the Restoration Control point.
- (d) Establish boundaries for facility failures for which the Restoration Control Office is responsible for the make good reroute.
- (e) Obtain priority make good instructions pertaining to various facilities and pass this information to the Restoration Control Offices within the Division so that individual restoration plans can be form-

ulated by those offices. Priorities will normally be governed by (1) the number of select circuits on the facility and (2) traffic requirements.

- (f) Assist the Restoration Control Office in formulating restoration plans.
- (g) See that adequate equipment and necessary communications are provided at the offices involved in establishing restoration reroutes.
- (h) Insure that Restoration Control Offices schedule periodic exercises to test the efficiency of restoration plans.

7.02 The Restoration Control Office is responsible for the overall coordination of restoration plan reroutes for facilities which locate within a specific territory.

(A) Prior to failure the Restoration Control office will:

- (a) Prepare a restoration plan for each facility in the controlled territory in accordance with priority instructions to restore up to a complete route failure. An alternate plan for each failure should also be prepared wherever possible. Use format as shown in Attachment 2, Examples A, B, C and D.
- (b) Appoint Sub-Control Offices, if necessary for each restoration plan and specify on the plan the portion of the reroute for which they are responsible. This will be permissible with Division Plant Superintendent concurrence.
- (c) Furnish copies of restoration plans to all Junction Offices involved. Copies should be sent to District Plant Superintendents, Division Plant Superintendents, and Area Plant Managers involved and the New York, Mt. Kisco and Ft. Carson Status Centers.

(d) Prepare revisions necessary to maintain up-to-date restoration plans and distribute to all offices concerned.

(e) Prepare and distribute on a quarterly basis to all offices concerned a check sheet of all restoration plans in the controlled territory. The check sheet should list plan number, current plan issue, and junction offices involved in establishing the plan. Use the format shown in Attachment 9.

(f) Maintain a Restoration Priority List for each route in the restoration control office territory. This list should indicate the route, facilities on the route, priority, and restoration plan choices for single and/or total route failures. Use format shown in Attachment 10. Copies should be distributed to Administrative Offices and Status Centers.

(g) Schedule periodic exercises as called for in Part 9 of this section to test the efficiency of restoration plans for which the Restoration Control Office is responsible.

(h) Be responsible for working with the Division Restoration Coordinator, other Restoration Control Offices, Sub-Control Offices and Junction Offices to coordinate the establishment, by the effective date, of all new or revised restoration plans. Dry runs on all new or revised plans must be held prior to the effective date.

(i) The Restoration Control Office may not delegate the responsibility for the overall restoration of a failed facility.

(j) Prepare instructions for setting up the Restoration Communications Network to all points involved in the restoration plans. A sufficient number of telephones must be installed in each Restoration Control Office or Restoration Center to preclude a busy condition. Multiple phones must be on a rotary arrangement.

(B) During Restoration the Restoration Control Office will:

(a) Start immediately the planned restoration procedures, when it is known that trouble is in the Restoration Control Office territory by the report of the loss of one or more "L" Section, "L" unit or MUR on a particular route.

Note: The planned restoration procedures may be used for other than a coaxial cable or a radio relay route failure, under the following conditions:

- (1) If one coaxial tube or radio relay channel fails, when its regular assigned protection is unavailable, the pre-arranged plans should be used for the make good.
- (2) When planned construction activities necessitate release periods on a route.

- (3) Unusual conditions may arise that will require the release of facility for plant purposes.
- (b) When requiring the release of television facilities for additional restoration make goods, go to the appropriate TV Control Office per standing instructions.
- (c) Determine and verify locations and extent of facility failures based on information received from other points.
- (d) Decide whether or not to place a restoration plan or plans into effect.
- (e) Decide which restoration plans to put into effect in accordance with priority instructions concerning the failed facilities.
- (f) Place necessary restoration plans into effect by initiating calls to offices per the notification chain.
- (g) Advise the New York Status Center as to the action taken and the progress of restoration.
- (h) Coordinate setting up the overall restoration facility.
- (i) Coordinate other matters as specific cases may require.
- (j) Sectionalize and clear troubles on the reroute with the aid of the Sub-Control Offices and Junction Offices.
- (k) Maintain contact with the terminal offices of the restoration facility reroutes and Sub-Control Offices and determine when the overall continuity of the make good facilities is satisfactory.
- (l) Coordinate with the terminal offices of the restoration reroute, the make good of services on the restoration facilities.
- (m) Maintain a running record of time and step-by-step progress of each restoration plan put into effect. A sample progress chart is shown in Attachment 5.
- (n) Maintain periodic contact with the office controlling the facility break.

C. After Trouble Clearance on the Regular Facility is completed the Restoration Control Office will:

- (a) Notify and direct all offices involved to restore services on their normal facility layouts. This should be accomplished by requesting the transmitting terminal to double feed the normal facility in addition to the restoration reroute facility. The receiving terminal should then verify continuity and levels of the normal facility layout before restoring service on the normal layout. This procedure should be repeated until all services are restored to their normal layouts in both directions of transmission.
 - (b) Be responsible for seeing that all facilities used for restoration reroutes are returned promptly to their normal layouts and the Facility Control Offices notified.
 - (c) Advise the New York Status Center that restoration plans are no longer in effect and all services are operating on their normally assigned layouts.
- 7.03 The Junction Office is responsible for rapidly performing any type of planned function initiated by a Restoration Control Office.
- (A) Prior to failure the Junction Office will:
 - (a) Prepare an Office Plan for each restoration plan involving the office.
 - (b) Maintain an accessible and up-to-date storage file of all restoration plans and office plans involving the office.
 - (c) Initiate recommendations, via lines of organization, for restoration equipment required such as trunks, pads, pilot filters and adequate communications to Sub-Control and/or the Restoration Control Office. Communications facilities should include unlisted telephones equipped with distinctive bells or horns and loudspeakers.
 - (d) Report promptly any facility failures to the responsible Restoration Control Office.
 - (e) Conduct on the job training and office rehearsals to insure that all personnel are qualified and are familiar with restoration procedures.

(f) Notify the responsible Restoration Control Office of any changes or additions to facility or office layouts which will effect Restoration Plans.

(B) During Restoration the Junction Office will:

(a) Promptly and efficiently perform all restoration functions required by a restoration plan or plans pertaining to the office when so requested.

(b) Maintain contact at all times with the Restoration Control Office and other offices as required during restoration activities and report promptly when the necessary functions have been completed or difficulty is being encountered.

(c) Keep intact the ordered restoration plan in that no change shall be made or no part of the plan shall be taken to make good another plan or service without first obtaining authority from the originating Restoration Control Office. **Conspicuous** designations on patches and switches should be used to **identify** the restoration plan that is in effect.

(d) Be ready to perform any additional functions requested by the Restoration Control Office.

(e) Maintain a running record of time and step-by-step progress of restoration plan functions put into effect for the particular office.

(f) At the time of a coaxial cable or radio relay failure, terminate the receiving **failed facility to prevent noise from being transmitted into succeeding sections.**

(g) Feed the proper pilots into the good portion of the "L" section to restore any super-groups that normally drop at the junction office and are assigned to the good portion of the failed L section.

(h) When the reroute plan is established and proper pilots are being supplied over the make good facility from the "L" section terminal, any pilots being fed by a Junction Office should be removed, when required.

(C) After trouble clearance on the regular facility is completed the Junction Office will:

(a) Restore restoration plan functions promptly to their normal condition when requested to do so by the responsible Restoration Control Office.

7.04 The Sub-Control Office when named by a plan, will be responsible for handling a portion of the make good facility that cannot be effectively administered by the Restoration Control Office.

(A) Prior to failure the Sub-Control Office will:

(a) Maintain an accessible and up-to-date storage file of all restoration plans where the office is named a Sub-Control.

(b) Advise the Restoration Control Office of any changes that are required to keep information on sub-controlled facilities up-to-date.

(B) During restoration the Sub-Control Office will:

(a) Establish, line up and test the particular portion of the reroute specified on the restoration plan.

(b) Will not make facility substitutions or other changes within the sub-controlled portion of the reroute, except under the direction of the Restoration Control Office, as this may conflict with other plans being established.

(c) Maintain contact with and promptly report to the Restoration Control Office, when the Sub-Controlled portion has been established and tested or when difficulty is being encountered.

(C) After trouble clearance on the regular facility is completed the Sub-Control Office will:

(a) Promptly put regular all facilities used in the controlled portion of the reroute when requested to do so by the responsible Restoration Control Office.

7.05 All Offices

(A) During a failure all offices involved in the restoration will:

(a) Maintain a complete log of all restoration activities involving their office. This may be in written form or in chart form. Attachment 5 shows a sample chart for logging restoration activities.

8. OTHER CONSIDERATIONS

8.01 In order to establish a restoration at a Junction Office, adequate trunking arrangements must be available. Transmission difficulties occur when interconnecting various broadband facilities. Attachment 4 lists the required equipment necessary for interconnecting the various broadband facilities. Attachment 11 to this section consists of sketches showing patches and equipment required for the various restoration reroutes. Level data shown on these sketches must be adhered to. All offices should refer to these sketches when preparing office plan formats.

8.02 It is most important that all testroom personnel be instructed, with periodic review, in restoration procedures. Prompt restoration of service requires immediate attention. An important follow through step in connection with service restoration is that of notifying the circuit control office, to turn up the message trunks involved in the failure, as soon as possible, after the restoration of the facilities.

The following methods of turning up trunks for service may be used after the restoration of the failed facilities has been completed using a planned reroute.

(a) Channel Groups

- (1) Every non-control terminal should loop back channel 12 of each failed channel group through a pad of the proper value (i.e., 17db or 23db).
- (2) Each control office of a failed channel group should check the continuity by placing testing tone on channel 12 and observing its return from the non-control terminal at the proper level +2db.
- (3) When channel 12 checks satisfactorily per the above test, the control office should call the non-control terminal to restore channel 12 to normal and proceed to turn up all channels in the channel group. The control office need not wait for the official notification from the group or supergroup control offices that the failed facility has been restored but should proceed as above.

(b) Message Circuits

- (1) The control terminal should, starting 10 minutes after a failure of a broadband facility involved in the restoration plans, test each trunk affected by the failure periodically for continuity.
- (2) If a continuity test indicates the circuit is satisfactory for service it should be turned up to traffic. The control office need not wait for the official notification from the channel group control office before turning the circuits up for service.

8.03 If your testroom is a terminal office of a failed "L" section (either on Coaxial or Radio Relay), advise the Restoration Control Office of the failure, but do not attempt an overhead patch for a make good. For example: A failure of the Philadelphia - Baltimore "G" cable involves the 1L NY⁴ - Wash. 1, the 2L and 3L Phila. 2-Wash. 1 sections. In this case, NY⁴ as Control Office of the 1L NY⁴ - Wash. 1, should not attempt an overall patch to restore the failed "L" section. The Restoration Control Office (Philadelphia) has the planned restoration and the priority schedule and will establish the required restoration plans.

8.04 It will be the responsibility of each facility control office to advise the Restoration Control Office of any changes within his office that will affect the structure of his C-1 alarm network or his facility and office layout.

8.05 A means of quickly determining what action is necessary to restore service in the event of a multi-route failure must be incorporated into the Restoration Control Offices procedures. The following is one possible method:

- (1) Prepare a master chart which should include every section (micro-wave, coaxial cable, A-2 etc.) used by the control office in the restoration reroutes. Each section shall be assigned a number starting with 1. (Attachment 6.)
- (2) Prepare a file of its controlled plans. This file consists of a McBee Keysort card for each plan and will have a diagram of the reroute with the sections numbered. The card shall also be notched to indicate each section used in the reroute. (Attachment 7).

(3) The Restoration Control Office upon being informed of a route failure proceeds to activate the proper restoration plans. When a second route failure is indicated, the Restoration Control Office removes from his file those plans that route through the second route failure. To do this, a sorting tool is inserted through the perforation having the numeral corresponding to the section involved in the second failure. This will allow all cards (plans) using that section to be released from the file. Scanning of the released cards (plans) will immediately reveal what plans being established for the first failure are affected by the second failure and cannot be established. This information is relayed to the Division Service Group for priority instructions.

(4) The Division Service Groups and the Area Traffic Circuit Supervisor shall analyze the information received from the various Restoration Control Offices. Based on this analysis the priorities for further restoration in addition to the plans being established can be determined and given to the Restoration Control Offices for activation.

8.06 Attachment 8 to this section is labeled Emergency Restoration of L-3 Pilots. The step-by-step procedure is outlined on the drawing.

9. TEST OF PLANS

9.01 Each Restoration Control Office must schedule periodic exercises (dry runs) to test the efficiency of the plans for which the office is responsible. Such dry runs should encompass a check of circuit continuity by measurement of a tone on the restoration layout. Whenever possible, a double feed over the restoration should be made at the transmitting end. At the receiving end an actual transfer to the make good should NOT be completed.

9.02 The Restoration Control Office should schedule dry runs so that each testroom coverage period will be able to participate. When the establishment of a make good is not completed within a reasonable time period, the plan should be again exercised after steps have been taken to eliminate the cause of the delay.

9.03 When a dry run is called by the Restoration Control Office, the following terminology should be used when notifying other offices in the notification flow chart "ESTABLISH RESTORATION PLAN (NUMBER OR NUMBERS) THIS IS A DRY RUN - REPEAT, THIS IS A DRY RUN". Log entries should be made similar to that required for an actual restoration.

9.04 In addition to the Restoration Control Office, various staff organizations such as District, Division, Area or Plant Operating Engineer thru the New York Status Center, may request a dry run at any time.

9.05 When a dry run is called by an administrative office or the New York Status Center, the request may be made to any office who might normally have knowledge of an actual failure on the facilities. The person originating the request to an office shall:

- (1) Identify himself.
- (2) State that this is a dry run.
- (3) Name the section of the facility or the terminals of the route assumed to have failed.
- (4) State that start time is now.
- (5) Request notification when continuity has been checked on the restoration.

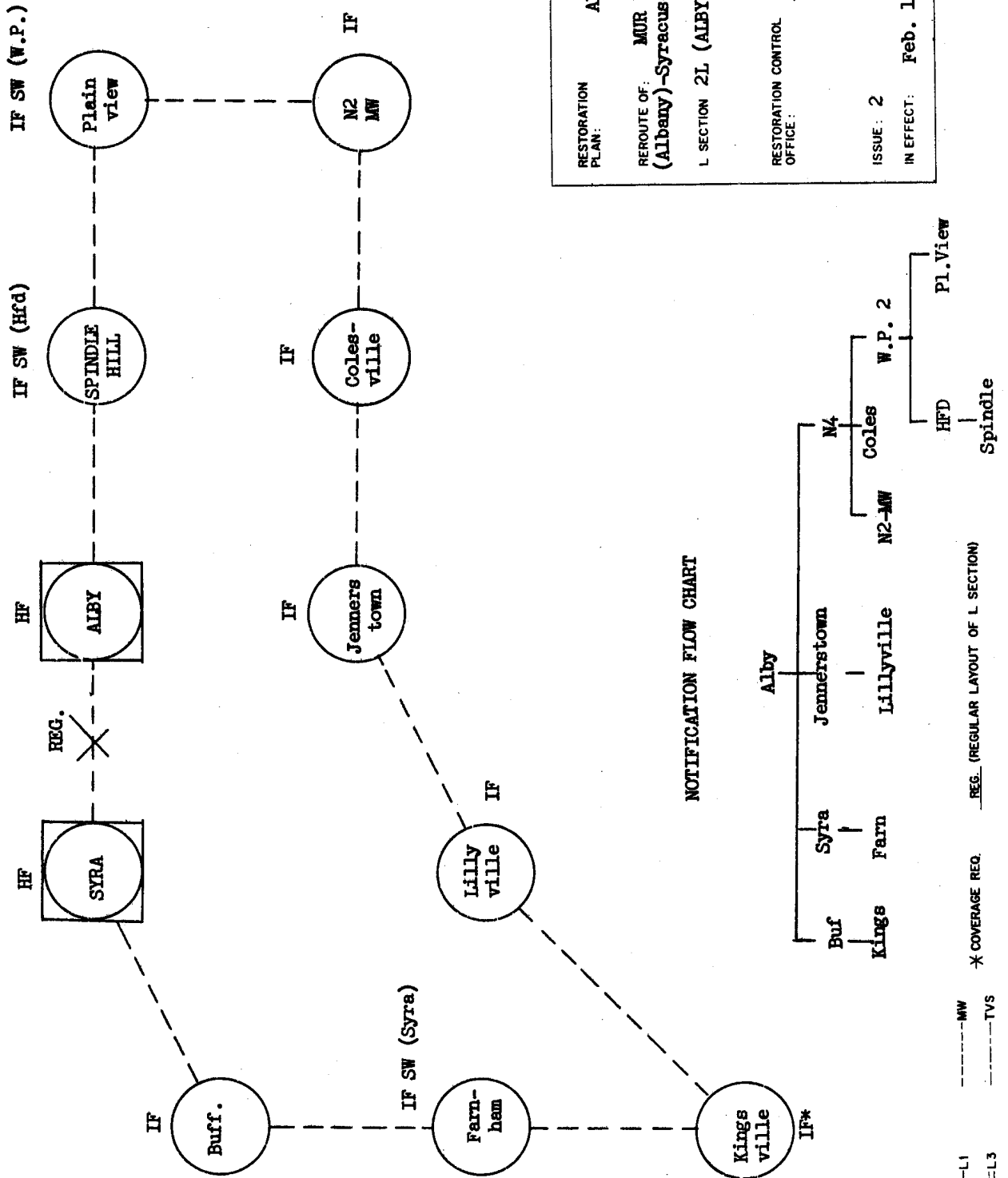
The office accepting this request shall repeat that this is a dry run and name the facility or route assumed to have failed. Notification to establish the restorations requested shall then be carried out in the normal manner.

9.06 Dry Runs on individual office plans are left to the office concerned. Such exercises, whether actual or simulated, may be run as often as necessary to train office forces.

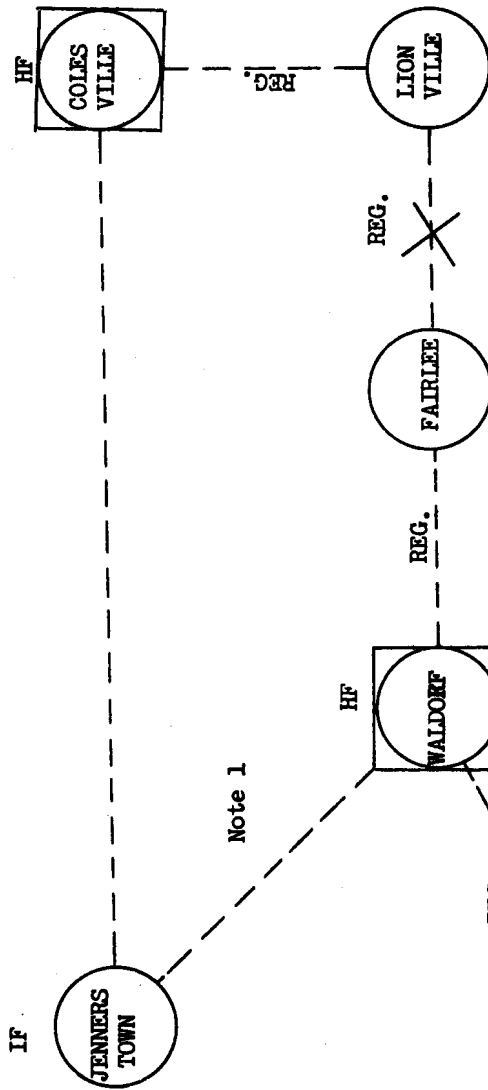
Attached:
Attachments 1 thru 11

RESTORATION CONTROL OFFICES

<u>Office</u>	<u>Prefix</u>	<u>Office</u>	<u>Prefix</u>
Albany, N. Y.	AY	Madison, Wisc.	MA
Albuquerque, N. M.	AQ	Miami, Fla.	MI
Atlanta 1, Ga.	AN	Minneapolis, Minn.	MP
Atlanta 2, Ga.	AT	Montreal, Que.	MO
Birmingham, Ala.	BM	Nashville, Tenn.	NA
Boston, Mass.	BX	New York, N. Y.	NY
Calgary, Alta.	CA	Norway, Ill.	NO
Charlotte, N. C.	CE	Oklahoma City, Okla.	OC
Chicago 2, Ill.	CH	Omaha, Neb.	OM
Cleveland, Ohio	CV	Philadelphia 2B, Pa.	PH
Dallas, Tex.	DL	Pittsburgh 1A, Pa.	PG
Dayton, Ohio	DY	Rockdale, Ga.	RK
Denver, Colo.	DR	St. John, N. B.	SJ
Detroit, Mich.	DE	St. Louis, Mo.	SL
El Paso, Tex.	ELP	Toronto, Ont.	TO
Indianapolis, Ind.	IP	Washington 1A, D. C.	WA
Jackson, Miss.	JK	Wayne, Pa.	WY
Jacksonville, Fla.	JV	White Plains 2, N. Y.	WP
Kansas City, Mo.	KC		



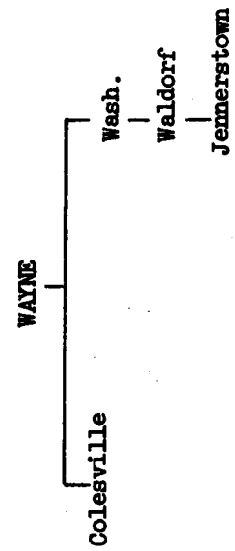
Example A



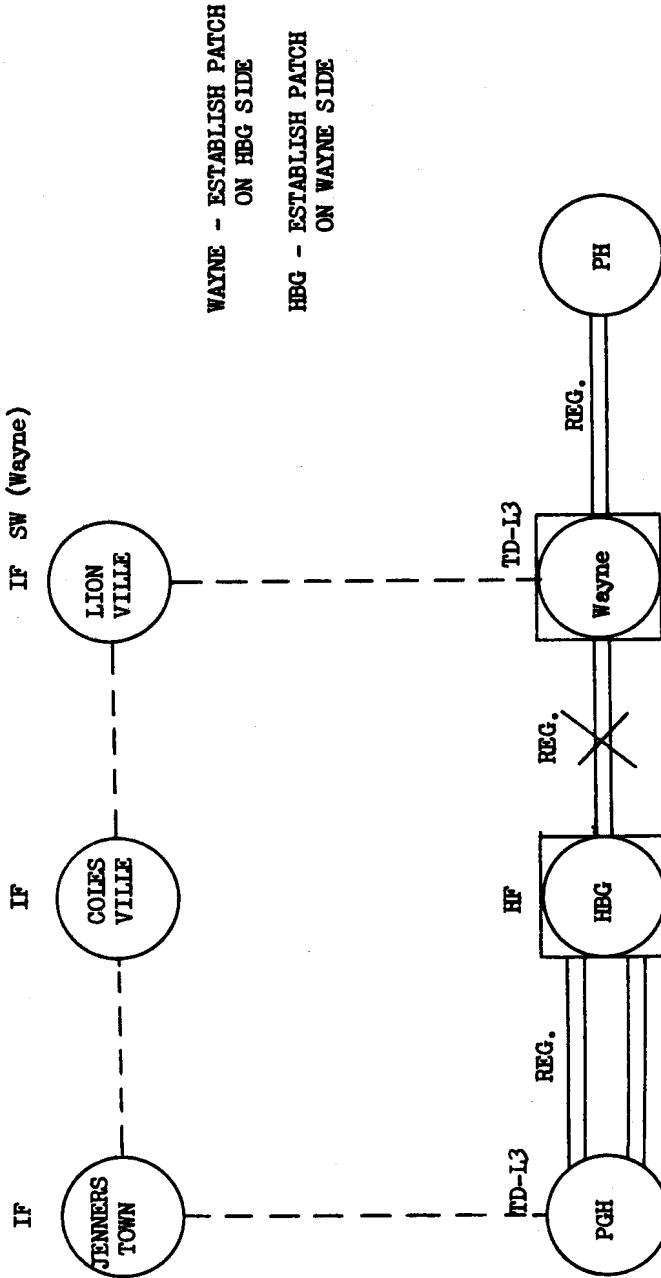
Note 1: Washington is responsible for setting up patch between Jennerstown and Waldorf.

Note 2: Colesville Sub Control - make continuity check.

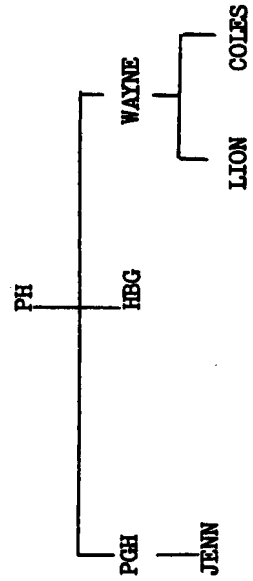
RESTORATION PLAN:	WY 000
REROUTE OF:	MUR 1 & 2 (Colesville)-Waldorf
L SECTION	5L (CLSVL)-GNBO
RESTORATION CONTROL OFFICE:	WAYNE
ISSUE:	2
IN EFFECT:	10-15-60



Legend:
 L1: Single line
 L3: Double line
 MW: Dashed line
 TVS: Dotted line
 * COVERAGE REQ.
 REG. (REGULAR LAYOUT OF L SECTION)



NOTIFICATION FLOW CHART



L1 _____
 L3 _____
 MW - - - - -
 TVS - - - - -
 * COVERAGE REQ. _____
 REG. (REGULAR LAYOUT OF L SECTION) _____

Example C

RESTORATION PLAN: PH 000
 REROUTE OF: L307/8
 Wayne-Harrisburg
 L SECTION 2 L 3 (P2)- PGH
 MG 1A, 2A, 3A
 RESTORATION CONTROL OFFICE: Philadelphia 2B
 ISSUE: 4
 IN EFFECT: Nov. 1, 1960

OFFICE PLAN PH 440A L-3 CARRIER

REROUTE OF 1 L 3 CLEVELAND - PHILA. (MG 1,2, 3)

DIRECTION PHILA. TO WAYNE

CAUTION: DRY RUN ONLY. OMIT STEPS 1(a) and 1(b). START AT STEP 2.

ACTUAL RESTORATION ONLY. (OMIT FOR DRY RUNS)

1. In BAY 525.8.
 - a. Remove "AMP. T" can cover for L304 PHILA-WAYNE
Remove both patch plugs from "AMP OUT" to "LINE IN" jacks.
 - b. Patch from "AMP OUT" to "TRS TRK TO TD-L LINK # 1" in BAY 525.11.

DRY RUNS ONLY. (OMIT FOR ACTUAL RESTORATION).

2. In BAY 525.11. Send LMC (at-21 dbm) into "TRS TRK TO TD-L LINK # 1

ACTUAL RESTORATION AND DRY RUNS.

3. In BAY 523.18. Remove patch plug from "AMP OUT" to "PAD IN" of "TRSG TD-L LINK # 1".
4. In BAY 523.18.
 - a. Patch "TRS TRK FROM BAY 525.11" to "11 db PAD IN".
 - b. Patch "11 db PAD OUT" to "PAD IN" of "TRSG TD-L LINK # 1".
5. In Bay 523.17.
 - a. Remove can cover from "LINK 1 & LINK 2 NET".
 - b. Remove 2 coaxial cords from "PRE LINK 1 IN & OUT".
 - c. Patch these two cords together.
 - d. DO NOT REPLACE CAN COVER.

DIRECTION WAYNE TO PHILA.

CAUTION: DRY RUN ONLY. OMIT STEPS 4 and 5. ADD STEP 3.

1. In BAY 523.17.
 - a. Remove 2 coaxial cords from "RES. LINK 1 IN & OUT".
 - b. Patch these two cords together.
2. In BAY 523.18.
 - a. Remove patch plug from "PAD OUT" to "AMP IN" of "REC TD-L LINK # 1".
 - b. Patch this "PAD OUT" to "4 db PAD IN".
 - c. Patch from "4 db PAD OUT" to "REC TRK TO BAY 525.8".

DRY RUNS ONLY. (OMIT FOR ACTUAL RESTORATION).

3. In BAY 525.8 Measure LMC at "REC TRK TO TD-L LINK # 1". (Approx. -55dbm)

ACTUAL RESTORATION ONLY. (OMIT FOR DRY RUNS)

4. In BAY 525.7.
 - a. Remove "AMP D" can cover for L 303 WAYNE - PHILA.
 - b. Remove all patch plugs from "AMP OUT" to "LINE IN" and "LINE OUT" to "AMP IN"
5. In BAY 525.8.
 - a. Patch from "REC TRK to TD-L LINK # 1" to AMP D
"AMP IN" in BAY 525.7.
 - b. Patch from "AMP OUT" to "SW TRK IN" of L 303 WAYNE-PHILA. Remove patch plug from "PIL HYB OUT A" to "SW TRK IN".

OFFICE PLAN FORMAT

THRU MW PATCH-PROT. TO PROT.

COLESVILLE, N.J. OFFICE PLAN

Plan PG 000 Making Good PGH-JENNERSTOWN MUR
Protection Channel R107-207- NY and R107-207-JNRTN

TO ESTABLISH:

1. IF SW Bays 123.8 and 123.9
Observe OPR and/or MAN lamps.
 - a. Lamps lighted - plan cannot be set up until condition is cleared.
 - b. Lamps dark - Lock out both PROT CHANS by simultaneously depressing PROT LO and MSTR buttons located in center left side of bays 123.8 and 123.9
Lamps LO COM in both bays should light.
2. Observe that RED SW OPR lamps are lighted on XMTG Switch panel in bays 123.8 and 123.9
before proceeding to patches. Contact the distant TDAS office to check operations.
3. PROG SW BAY 123.4
 - a. Remove 75 ohms TERM from PROT CHAN R207 NEW YORK CHAN OUT jack.
 - b. Insert one end of a coax patch cord in this CHAN OUT jack.
4. PROG SW BAY 123.4
 - a. Remove 75 ohms TERM from PROT CHAN R27 JNRTN CHAN IN jack.
 - b. Insert other end of the coax patch cord in this CHAN IN jack.
5. PROG SW BAY 123.4
 - a. Remove 75 ohms TERM from PROT CHAN R107 JNRTN CHAN OUT jack.
 - b. Insert one end of a coax patch cord in this CHAN OUT jack.
6. PROG SW BAY 123.4
 - a. Remove 75 ohms TERM from PROT CHAN R107 NEW YORK CHAN IN jack.
 - b. Insert other end of the coax patch cord in this CHAN IN jack.

TO RESTORE REGULAR:

1. In IF SW Bays 123.8 and 123.9
simultaneously depress MSTR and RST buttons located in center left side of bays. The LO lamps will be extinguished.
2. In PROG SW Bays 123.4 and 123.4
remove patch cords from CHAN OUT and CHAN IN jack on R107-207 NY
and R107-207 JNRTN Replace 75 ohms terminations in these jacks.

REQUIRED EQUIPMENT FOR VARIOUS BROADBAND
FACILITY INTERCONNECTIONS

<u>Interconnected Facilities</u>	<u>Equipment Required</u>
L-1 Terminal or thru (Coax) to L-1 Coax (SK 101)	None
L-1 Terminal or thru (Coax) from L-1 Coax (SK 101)	None
L-1 Terminal (Coax) to TD2 (SK 102)	WLEL + FMT + PEF (if required)
L-1 Terminal (Coax) from TD2 (SK 102)	WLEL + FMR
L-1 Thru (Coax) to TD2 (SK 103)	WLEL + FMT + PEF (if required)
L-1 Thru (Coax) from TD2 (SK 103)	WLEL + FMR + PEF (if required)
L-1 Terminal or thru (TD2) to TD2 (SK 104)	WLEL + FMT
L-1 Terminal or thru (TD2) from TD2 (SK 104)	WLEL + FMR
L-3 Terminal or thru (Coax) to L3 Coax (SK 105)	None
L-3 Terminal or thru (Coax) from L3 Coax (SK 105)	None
L-3 Terminal Coax (More than one MG) to TD2 (SK 106)	L-3 FG Amp + Atten + WLEL + FMT
L-3 Terminal Coax (More than one MG) from TD2 (SK 106)	L-3 FG Amp + Atten + WLEL + FMR
L-3 Terminal (TH) to L3 Coax (SK 107)	Atten + Hybrid
L-3 Terminal (TH) from L3 Coax (SK 107)	Atten
L-3 Terminal (TH) to TD2 (SK 108)	Atten + Coil + FMT
L-3 Terminal (TH) from TD2 (SK 108)	Atten + Coil + FMR
L-1 Terminal to L-3 MG (SK 109)	L-1 FG Amp + 7.7 db + PEF (if required)
L-1 Terminal from L-3 MG (SK 109)	L-1 FG Amp + 36 db or 4 db
L-1 Thru or branching (Coax) to L-3 MG (SK 110)	L-1 FG Amp + 7.7 db + PEF (if required)
L-1 Thru or branching (Coax) from L-3 MG (SK 110)	L-1 FG Amp + 36 db + PEF (if required)
TD-2 Chan to TH Chan (SK 111)	TD2 FMR + TH FMT + Atten
TD-2 Chan from TH Chan (SK 111)	TH FMR + TD2 FMT + Atten
L-1 Terminal or thru (TD2) to TD2 Chan (SK 112)	Mtce Spr WLEL & FMT
L-1 Terminal or thru (TD2) from TD2 Chan (SK 112)	Mtce Spr WLEL & FMR
L-1 Terminal to TD2 Chan Via TV trunks (SK 113)	L-1 FG Amp + 12 db
L-1 Terminal from TD2 Chan Via TV trunks (SK 113)	L-1 FG Amp + 28 db
L-3 Terminal (one MG) to TD2 Chan (SK 114)	WLEL + FMT + 29 db
L-3 Terminal (one MG) from TD2 Chan (SK 114)	WLEL + FMR + 4 db
L-3 Terminal (one MG) to L-1 Coax (SK 115)	29 db + Hyb
L-3 Terminal (one MG) from L-1 Coax (SK 115)	4 db
L-1 Terminal to L-3 MG (SK 116)	L-1 FG Amp + 11 db
L-1 Terminal from L-3 MG (SK 116)	L-1 FG Amp + 36 db

Notes - Where more than one MG of an L-3 system is connected to a TD-2 system remove noise blocking filter from input of FM Terminal Transmitter. Use regular TD-1 connecting link or long coaxial cord within an office, otherwise if link interconnects between two locations miles apart use a spare A2A link if available. When restoration is made over a regular TD-2 channel, lock the channel out of the switching system. Patching arrangements per sketches 101 thru 110 are preferred because they permit transmitting double feeds.

RESTORATION PROGRESS CHART

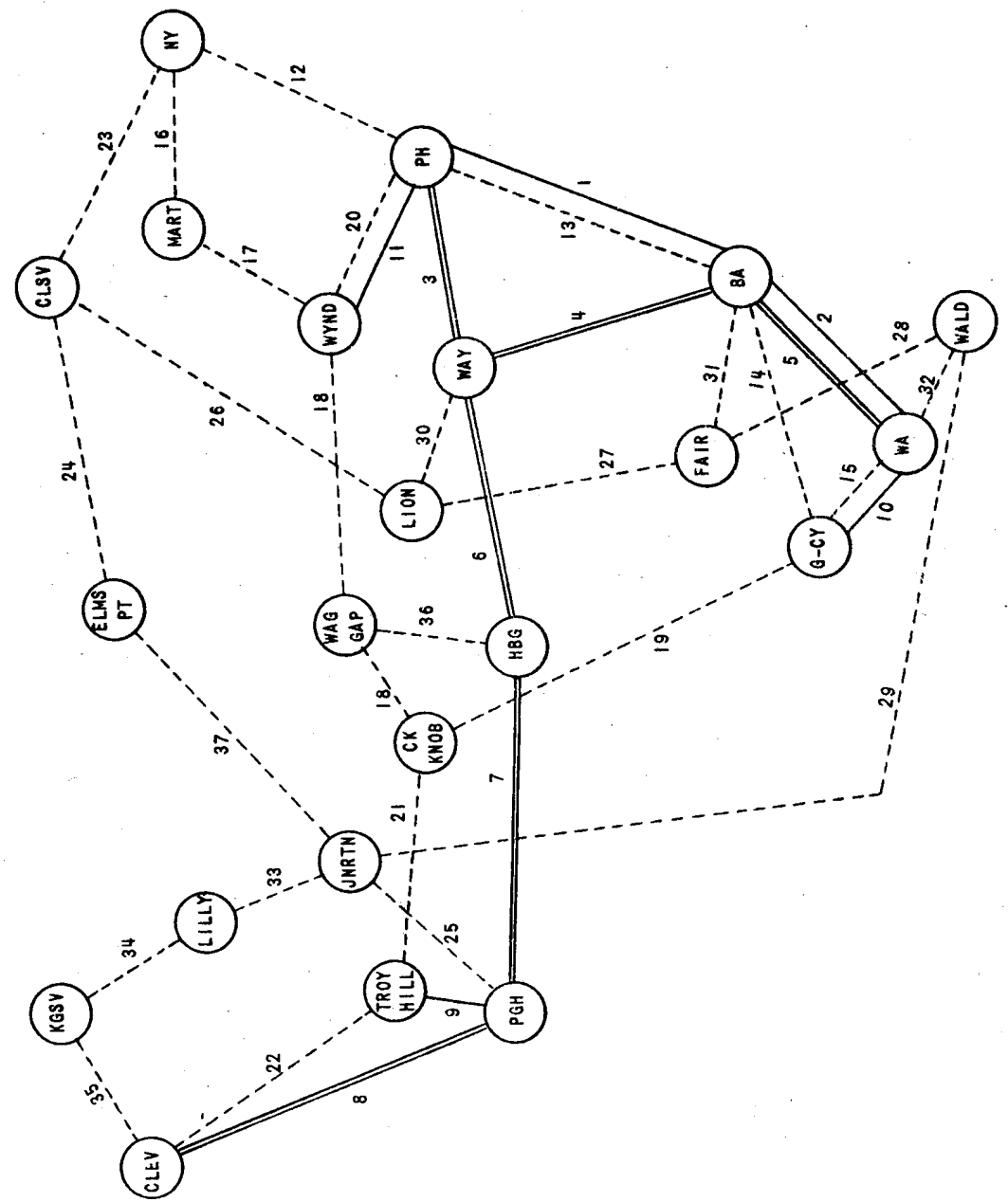
<u>Location of Break</u>		<u>Time of Failure</u>	<u>Date of Failure</u>	<u>Facilities Affected</u>		<u>Time Break Repaired</u>
<p>Time Restoration Communications Established</p>						
		<u>Time Flash Report Sent</u>		<u>TVS's Released</u>		
		<u>Time P1029 Report Sent</u>		For Plan _____ TVS For Plan _____ TVS For Plan _____ TVS For Plan _____ TVS		
<u>Plan #</u> <u>Asngd to</u> <u>Time</u>	<u>Terminal Patch</u> <u>Time estab</u>	City _____ Time Notified _____ Follow Up _____ Reported OK _____	City _____ Time Notified _____ Follow Up _____ Reported OK _____	City _____ Time Notified _____ Follow Up _____ Reported OK _____	Overall _____ Continuity OK _____ Time _____ Tested by _____	
<u>Plan #</u> <u>Asngd to</u> <u>Time</u>	<u>Terminal Patch</u> <u>Time estab</u>	City _____ Time Notified _____ Follow Up _____ Reported OK _____	City _____ Time Notified _____ Follow Up _____ Reported OK _____	City _____ Time Notified _____ Follow Up _____ Reported OK _____	Overall _____ Continuity OK _____ Time _____ Tested by _____	
<u>Plan #</u> <u>Asngd to</u> <u>Time</u>	<u>Terminal Patch</u> <u>Time estab</u>	City _____ Time Notified _____ Follow Up _____ Reported OK _____	City _____ Time Notified _____ Follow Up _____ Reported OK _____	City _____ Time Notified _____ Follow Up _____ Reported OK _____	Overall _____ Continuity OK _____ Time _____ Tested by _____	
<u>Plan #</u> <u>Asngd to</u> <u>Time</u>	<u>Terminal Patch</u> <u>Time estab</u>	City _____ Time Notified _____ Follow Up _____ Reported OK _____	City _____ Time Notified _____ Follow Up _____ Reported OK _____	City _____ Time Notified _____ Follow Up _____ Reported OK _____	Overall _____ Continuity OK _____ Time _____ Tested by _____	
<u>Plan #</u> <u>Asngd to</u> <u>Time</u>	<u>Terminal Patch</u> <u>Time estab</u>	City _____ Time Notified _____ Follow Up _____ Reported OK _____	City _____ Time Notified _____ Follow Up _____ Reported OK _____	City _____ Time Notified _____ Follow Up _____ Reported OK _____	Overall _____ Continuity OK _____ Time _____ Tested by _____	

BROADBAND RESTORATION REROUTES

- COAXIAL SECTIONS**
- 1-PHILA - BALT "G"
 - 2-BALT - WASH "G"
 - 3-PHILA - WAYNE "A"/L3/
 - 4-WAYNE - BALT "H"/L3/
 - 5-BALT - WASH "G"/L3/
 - 6-WAYNE - HBG "A"/L3/
 - 7-HBG - PGH "F" /L3/
 - 8-PGH - CLEVE "D"/L3/
 - 9-PGH - TROY HILL TIE
 - 10-GCY - WASH TIE
 - 11-PHILA - WYND "A"

MICROWAVE SECTIONS

- 12-N.Y. - PHILA.
- 13-PHILA. - BALT.
- 14-BALT. - GCY.
- 15-GCY. - WASH.
- 16-N.Y. - MARTINSVILLE
- 17-MARTSVL. - WYNDMOOR
- 18-WYND. - CLARKS KNOB
- 19-C.KNOB - GCY
- 20-PHILA - WYND
- 21-C.KNOB - TROY HILL
- 22-T.HILL - CLEVE.
- 23-N.Y. - COLESVILLE
- 24-CLSVL - ELMSPT
- 25-JENNERSTOWN - PGH
- 26-CLSVL - LIONVILLE
- 27-LIONVILLE - FAIRLEE
- 28-FAIRLEE - WALDORF
- 29-WALDORF - JENNERSTOWN
- 30-LIONVILLE - WAYNE
- 31-FAIRLEE - BALT
- 32-WALDORF - WASH
- 33-JENNERSTOWN-LILLYVL
- 34-LILLYVL - KINGSVILLE
- 35-KINGSVL - CLEVELAND
- 36-HBG - WAGGONERS GAP
- 37-ELMSPT - JENNERSTOWN



BROAD BAND RESTORATION
PLAN NUMBER. PH 441

L SECTION 2L3 PHILA 2B - PGH DATE 11/1/80


ASSIGNED L 307/8 CH P2-WAY ASSIGNED _____ CH _____

ASSIGNED MG 1A, 2A, 3A CH _____ ASSIGNED _____ CH _____

PH NY CLSV LION WAYNE

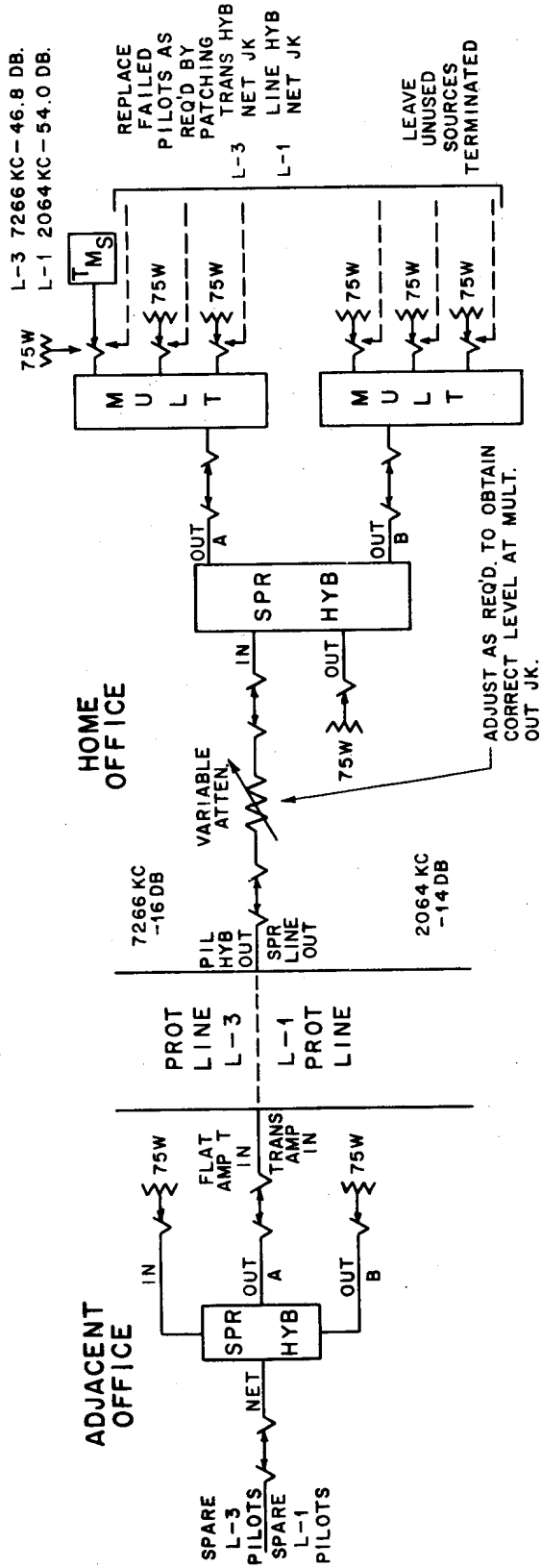
12 28 26 30 _____

_____ _____ _____ _____

KIDDEE 

37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1



STEP BY STEP PROCEDURE

1. LOCK OUT PROTECTION LINE RECEIVING AT HOME OFFICE.
2. HAVE ADJACENT OFFICE PUT SPARE PILOTS ON PROT LINE. USE MASTER CONTROLLED SYNCHRONIZED OFFICE IF POSSIBLE.
3. SET UP PATCHES AT HOME OFFICE AS SHOWN IN ABOVE SKETCH.
4. ADJUST PILOT LEVEL AT MULT JK OUT AS INDICATED FOR L-3 OR L-1. MAKE SURE ALL MULT OUT AND UNUSED SPR HYB JACKS ARE TERMINATED AT THE ADJACENT AND HOME OFFICES, WHEN THE PILOT LEVEL IS ADJUSTED.
5. REPLACE FAILED PILOTS ONE AT A TIME, WITH THE EMERGENCY SOURCE.
6. IF THE MULT OUT JK USED FOR CHECKING PILOT LEVEL IS NOT NEEDED TO RESTORE A FAILED LINE, TERMINATE IT WITH 75W WHEN THE FINAL FAILED LINE IS RESTORED.

**EMERGENCY RESTORATION OF
L-3 OR L-1 PILOTS**

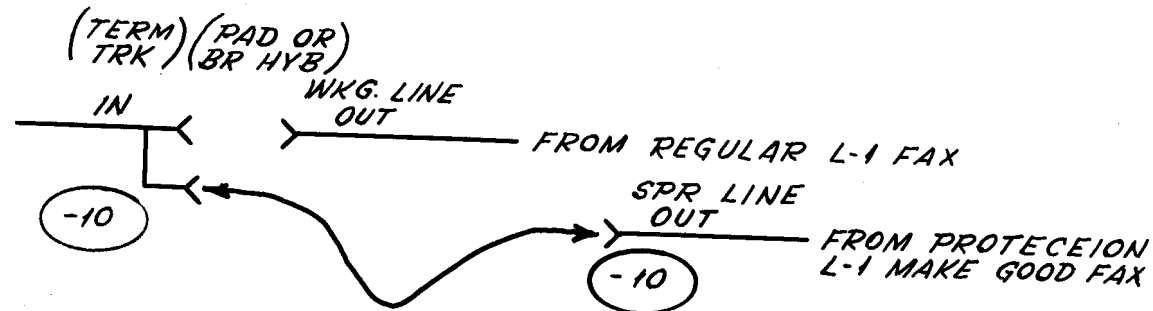
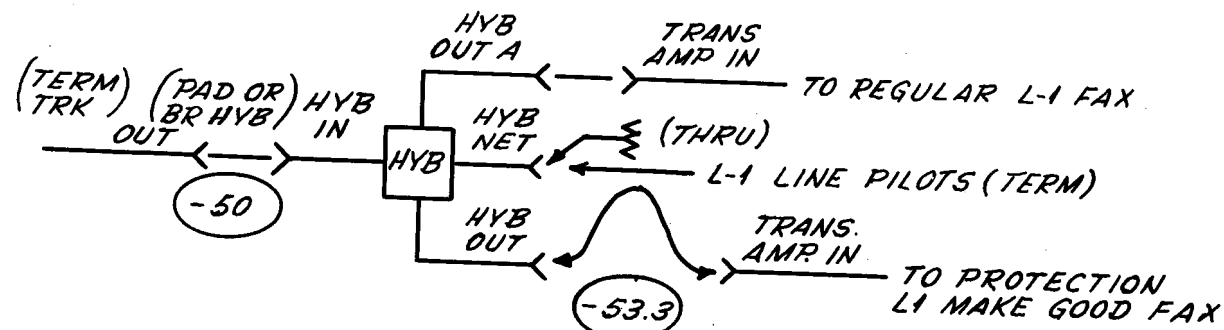
RESTORATION PLAN CHECK SHEET

ATLANTA 2 CONTROL RESTORATION PLANS

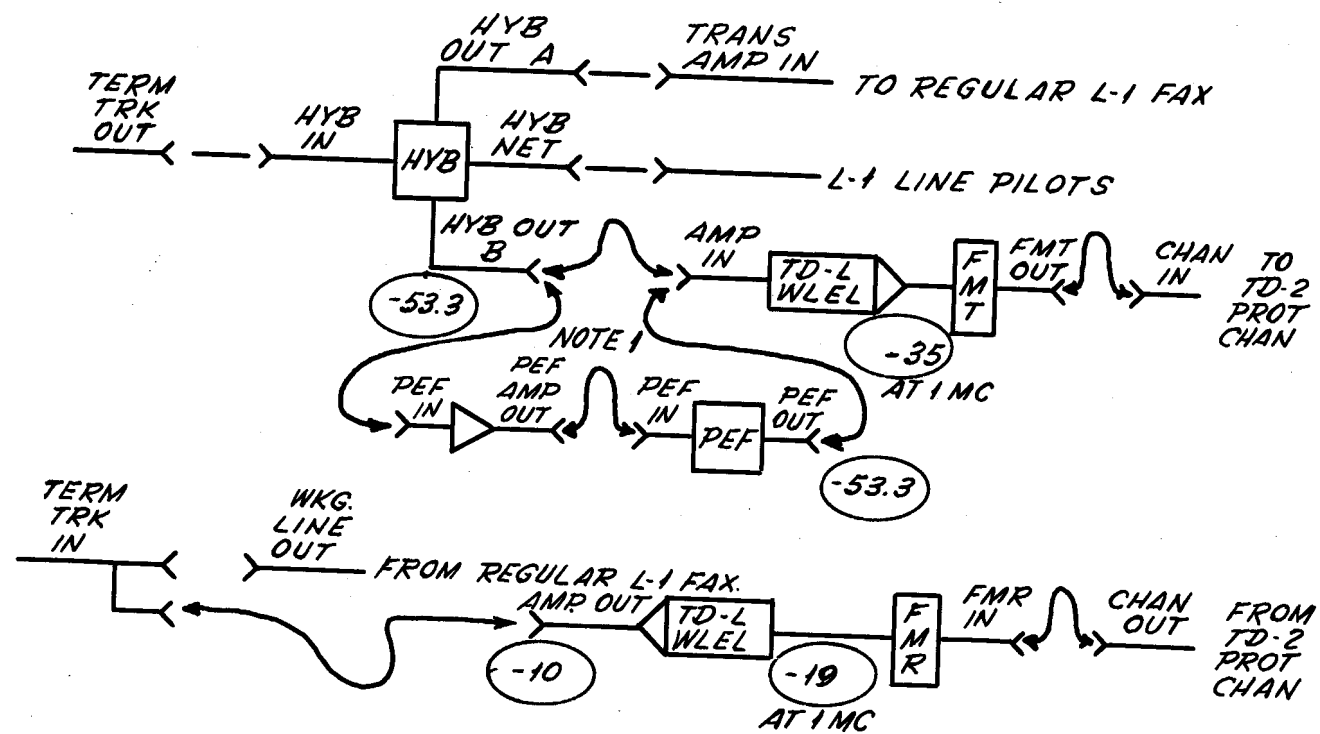
ISSUE NO	AT 602				AT 606						AT 607						AT 608							
	11	12	21	22	11	12	13	21	22	23	11	12	13	21	22	23	11	12	13	21	22	23		
	1	1	1	1	2	1	1	3	2	2	2	2	2	1	3	2	2	3	1	1	3	2	2	
ADAIRSVILLE					X	X	X	X		X	X		X	X	X	X	X	X	X	X	X		X	
AIR POINT								X	X	X		X		X		X							X	X
ALLENDALE																								
AUGUSTA																								
BIRMINGHAM	X	X	X	X																				
BR. SUMMIT								X	X	X		X		X		X							X	X
CHATTANOOGA					X			X			X													
CHAS., W.VA.								X	X	X		X		X		X							X	X
CHARLOTTE								X	X	X		X		X		X							X	X
CINCINNATI										X														
COLUMBIA #1																								
COLUMBIA #2																								
DAYTON								X	X	X		X		X		X							X	X
E'TOWN					X	X	X	X		X	X		X	X	X	X		X	X					
GOS. SPRINGS																								
GRANITEVILLE								X	X	X		X		X		X							X	X
GREENSBORO								X	X	X		X		X		X							X	X
GREENVILLE																								
HIGHLAND																								
HILLSBORO																								
INDIANAPOLIS								X	X			X		X		X							X	X
JACKSON			X	X																				

GOOD FOR ALL IN EFFECT PLANS TO 6-3-63

PATCHES TO MAKE GOOD L-1 TERM OR THRU (COAX)
ON L-1 COAXIALS - SK.101



PATCHES TO MAKE GOOD L-1 TERM (COAX)
ON TD2 CHANNEL - SK.102



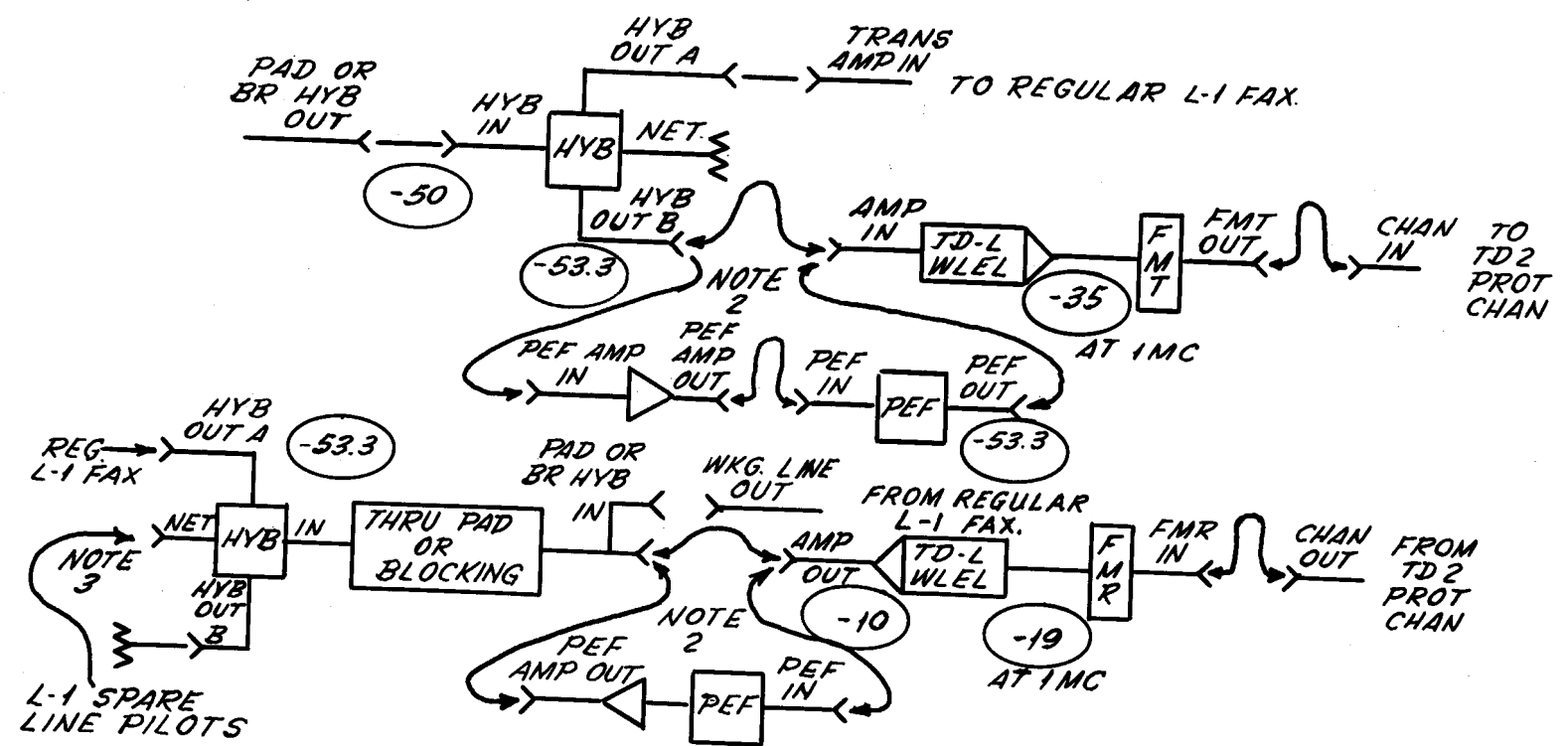
NOTE 1 - USE PEF EQUIPMENT IF PILOT ELIMINATION REQUIRED.

-10 CHANNEL LEVEL UNLESS INDICATED OTHERWISE

↪ PATCH CORD

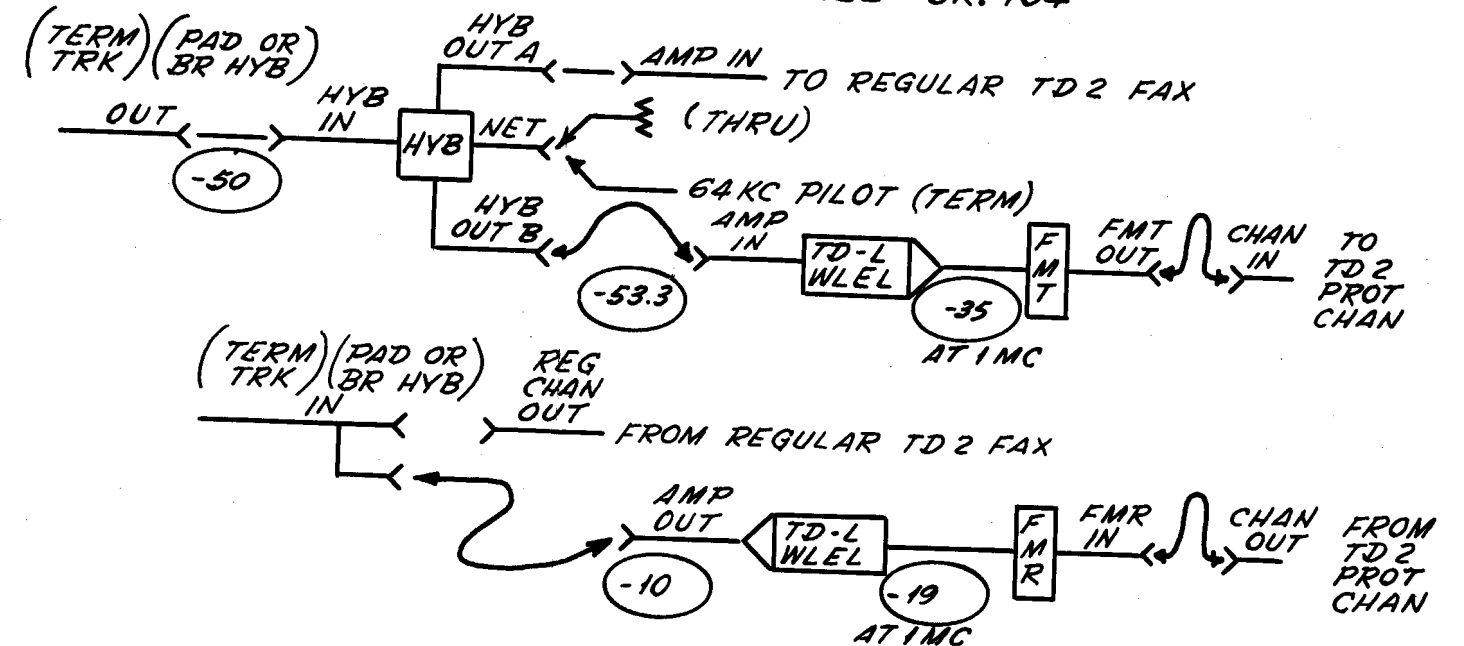
— PATCH PLUG

PATCHES TO MAKE GOOD L-1 THRU (COAX)
ON TD2 CHANNEL - SK.103



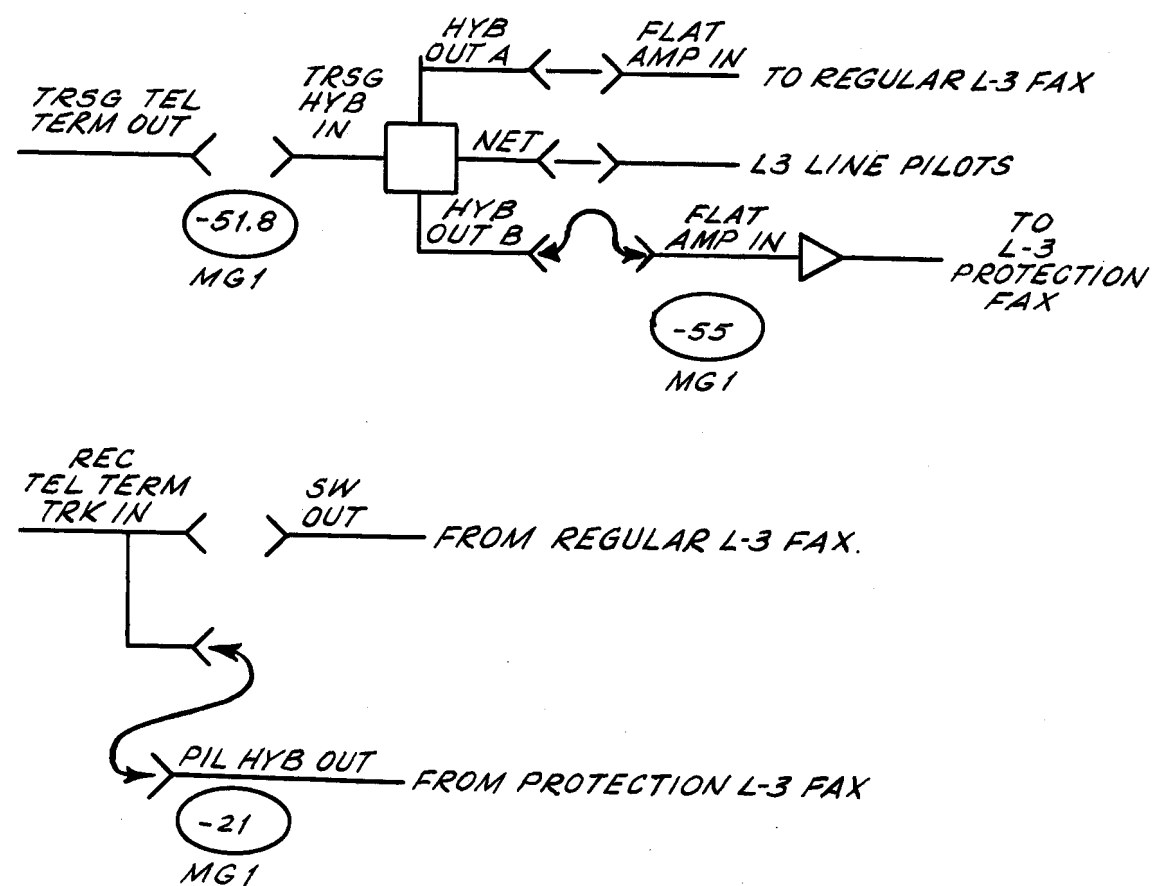
NOTE 2 - USE PEF EQUIPMENT IF PILOT ELIMINATION REQUIRED
NOTE 3 - PATCH HYB NET TO SPARE L-1 PILOTS IF PILOT ELIMINATION FILTERS USED OR IF L-1 LINE PILOTS NOT RECEIVED OVER MAKE GOOD.

PATCHES TO MAKE GOOD L-1 TERM OR THRU
(TD2) ON TD2 CHANNEL - SK.104



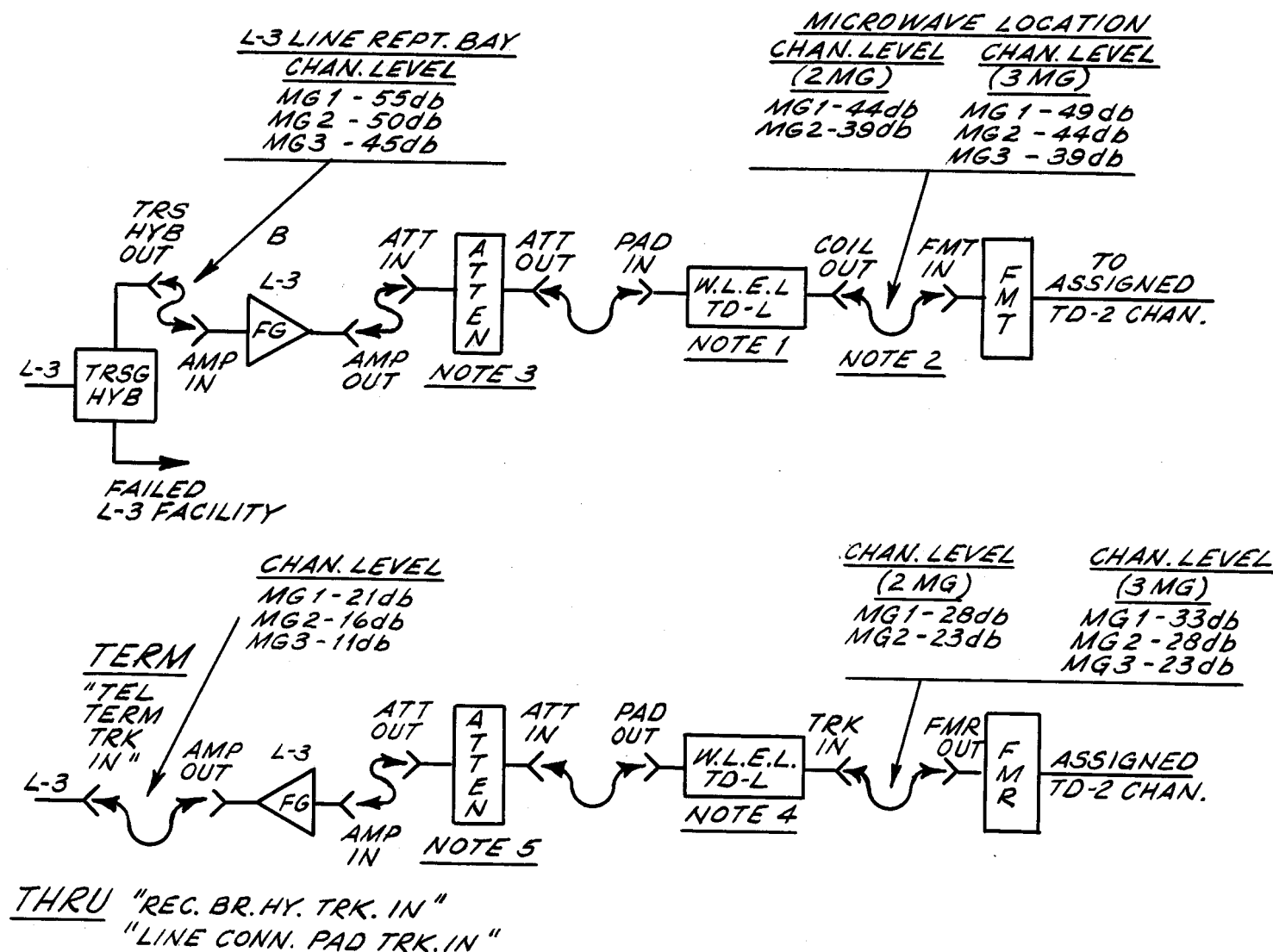
PATCHES TO MAKE GOOD L-3
TERMINAL OR THRU (COAX)
ON L-3 COAXIALS

SKETCH 105



PATCHES TO MAKE GOOD L-3 TERMINAL (COAX)
(MORE THAN ONE MG) ON TD2 CHANNEL

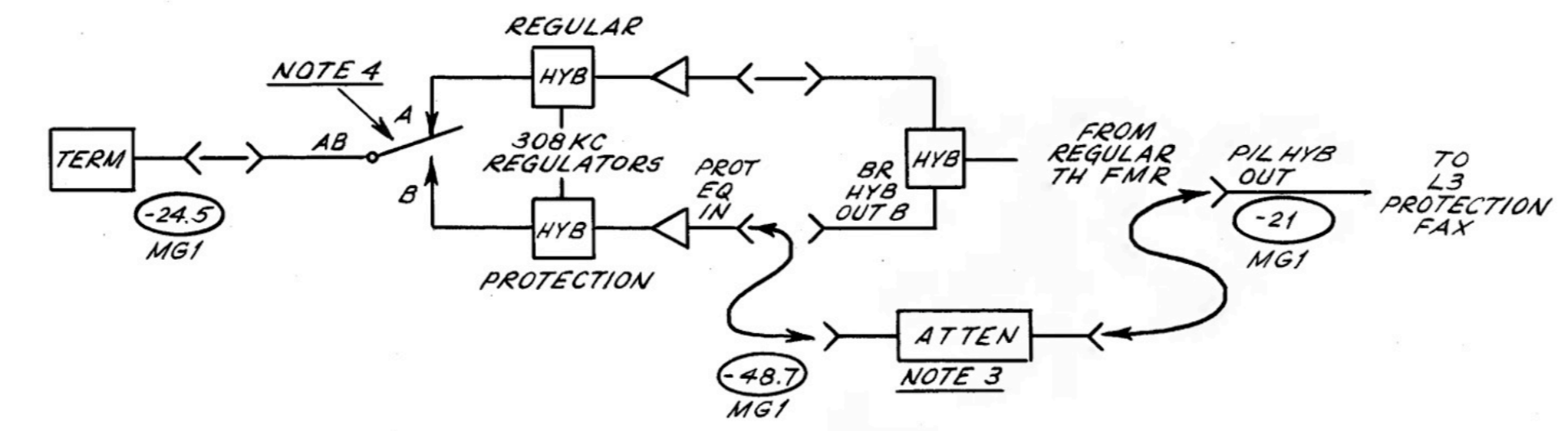
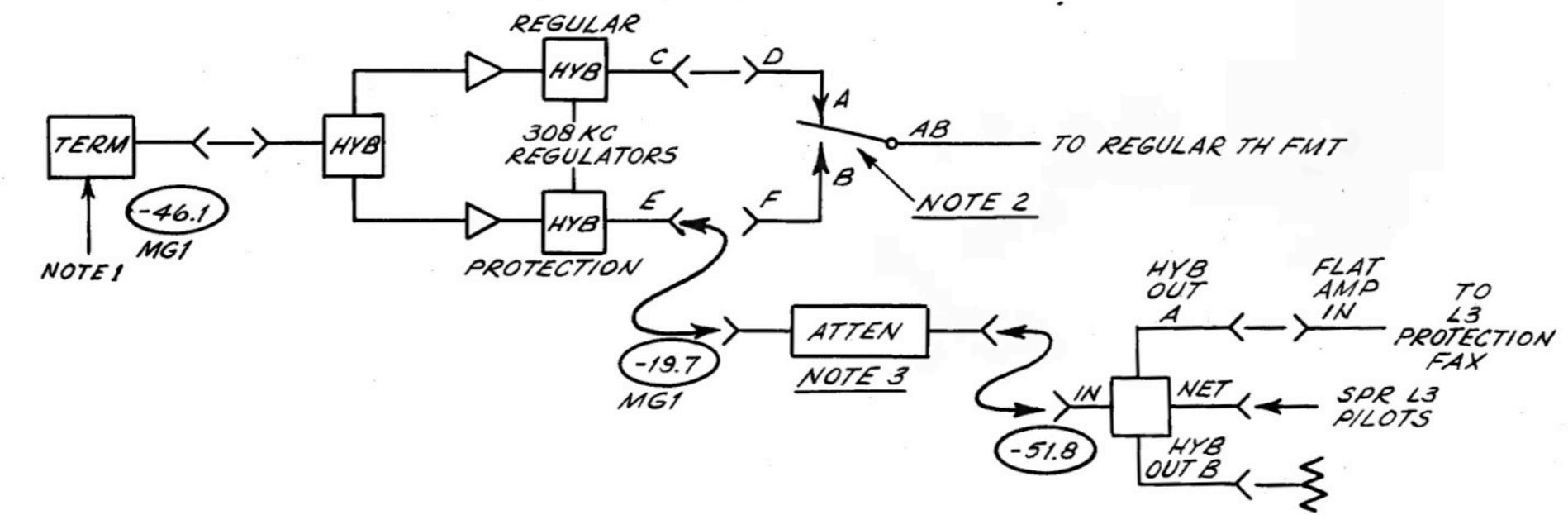
SKETCH 106



- NOTE 1. BY-PASS 457-A NET (PRE-EMPHASIS) AND L-1 F.G. AMPLIFIER.
NOTE 2. BY-PASS NOISE FILTER (525-R)
NOTE 3. ADJUST ATTENUATOR TO OBTAIN CHAN. LEVEL -MG1 AT FMT.
NOTE 4. BY-PASS 457-B NET (RESTORER) AND L-1 F.G. AMPLIFIER.
NOTE 5. ADJUST ATTENUATOR TO OBTAIN CHAN. LEVEL -MG1 AT AMP. OUT.

PATCHES TO MAKE GOOD L-3 TERM (TH) ON L3 COAXIALS

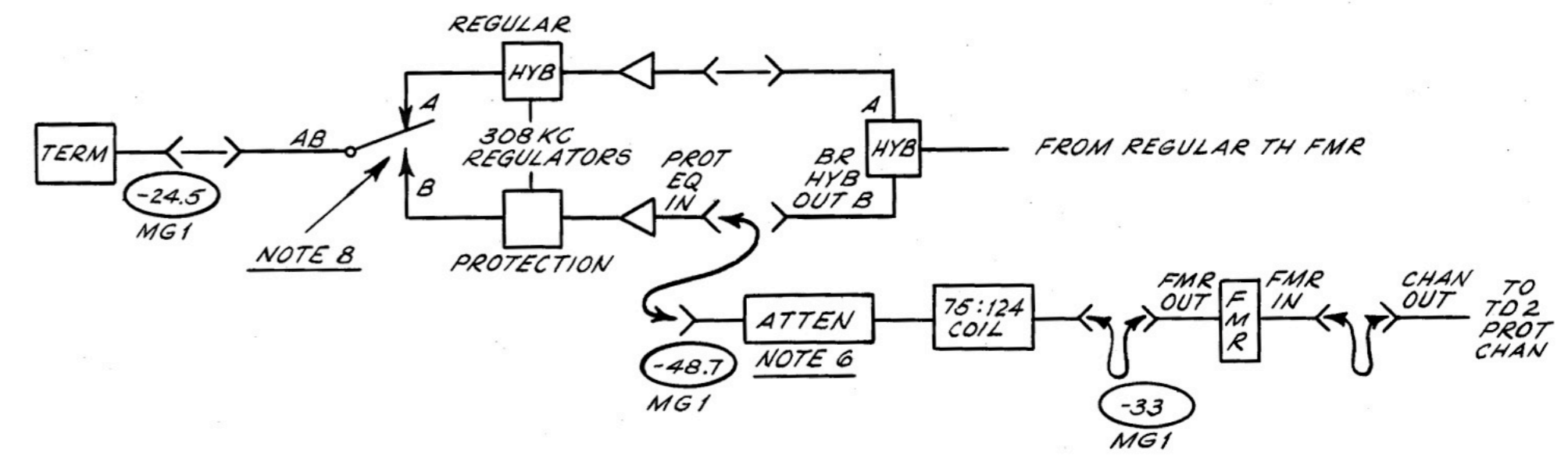
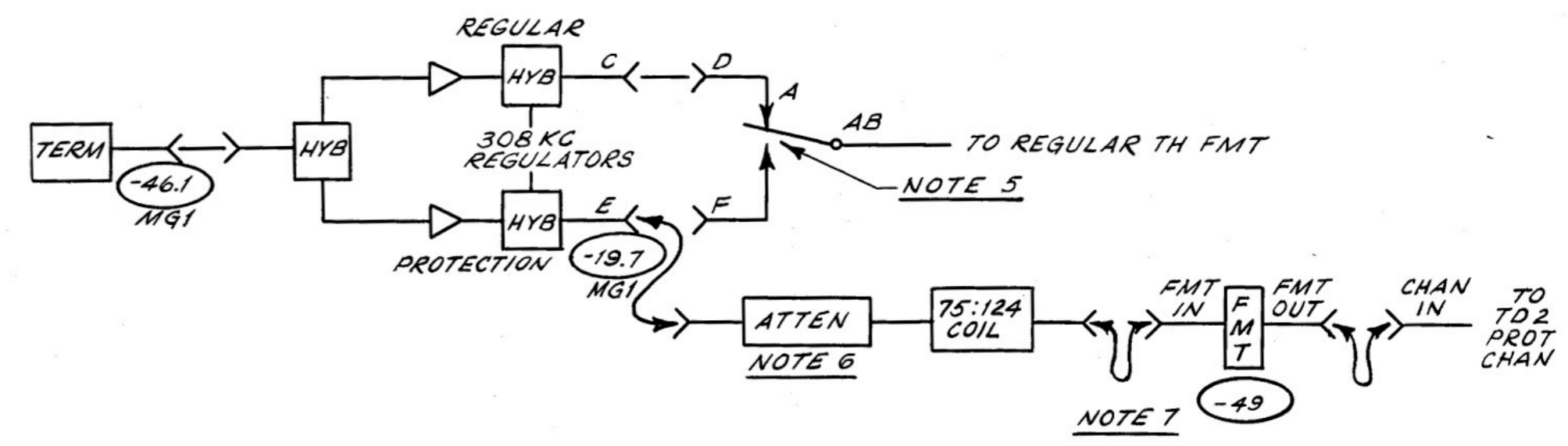
SKETCH 107



- NOTE 1 REMOVE 308 AND 8320 KC PILOTS FROM TRANSMITTING TERMINAL
- NOTE 2 LOCK SWITCH NORMAL
- NOTE 3 ADJUST ATTENUATORS FOR PROPER LEVELS
- NOTE 4 OPERATE SWITCH TO PROTECTION TO SWITCH SERVICE TO MAKE GOOD FACILITY
- NOTE 5 LOCK SWITCH NORMAL
- NOTE 6 ADJUST ATTENUATORS FOR PROPER LEVELS
- NOTE 7 BYPASS NOISE FILTER (525-R)
- NOTE 8 OPERATE SWITCH TO PROTECTION TO SWITCH SERVICE TO MAKE GOOD FAX.

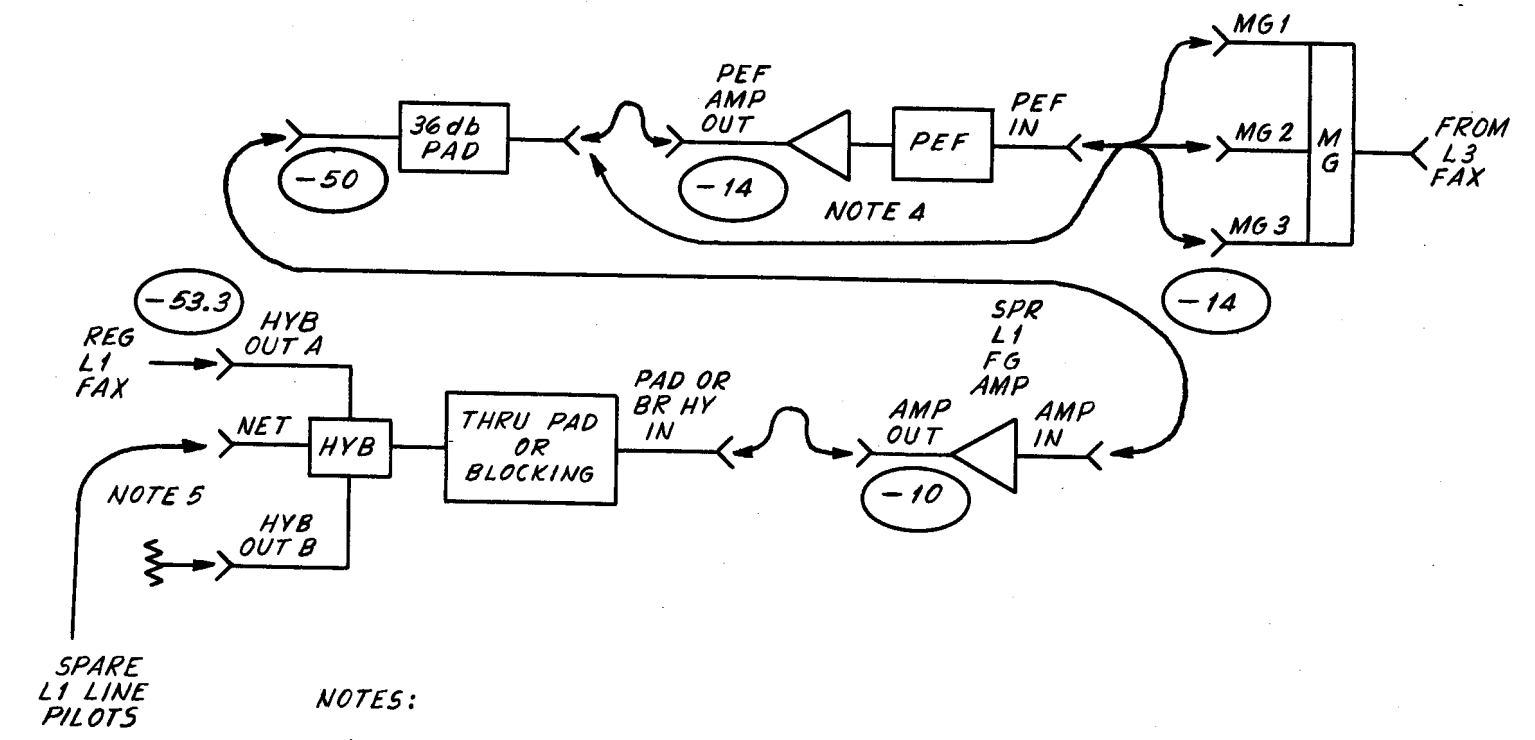
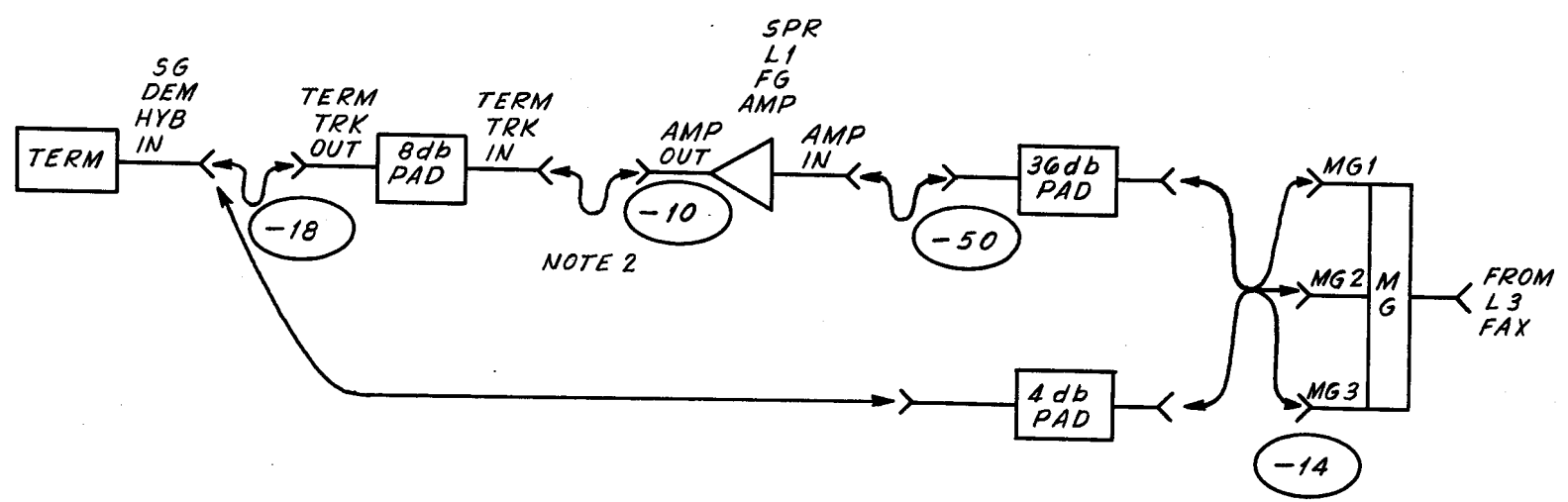
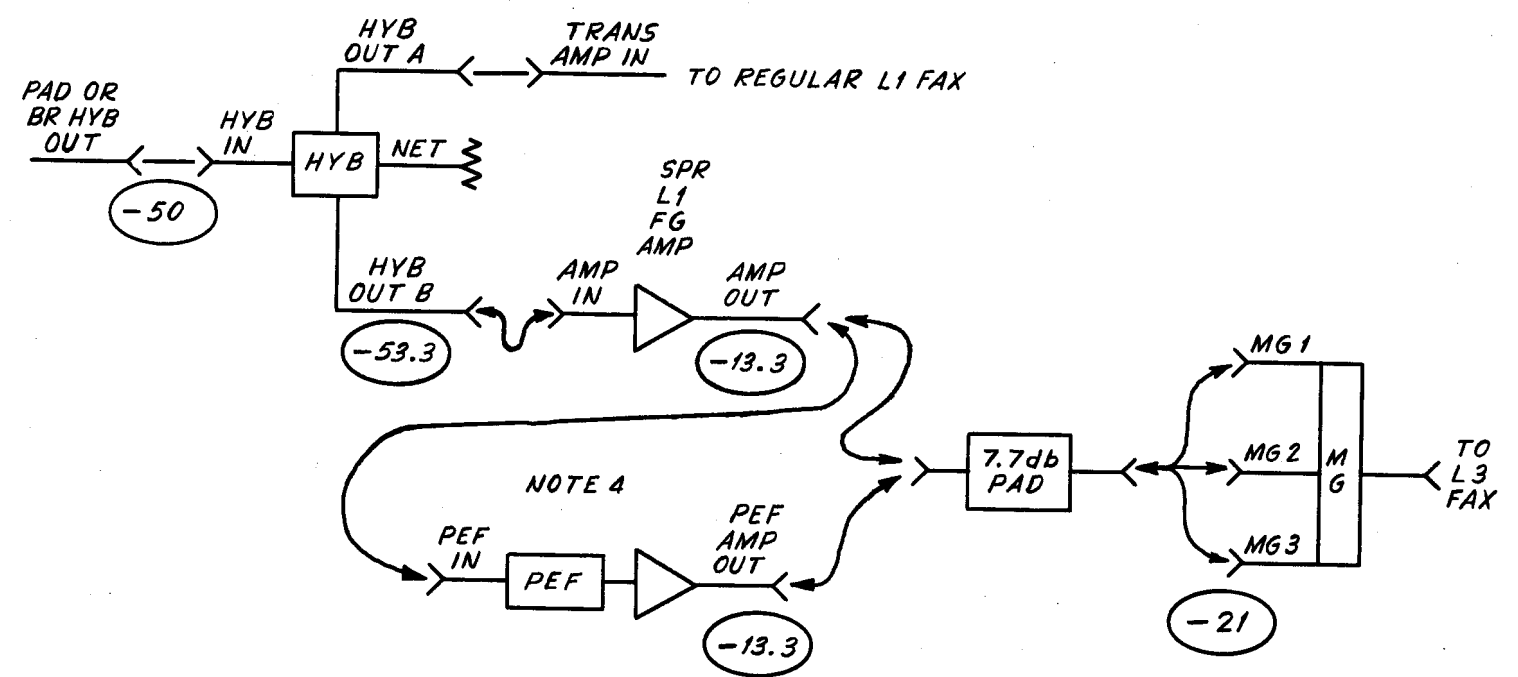
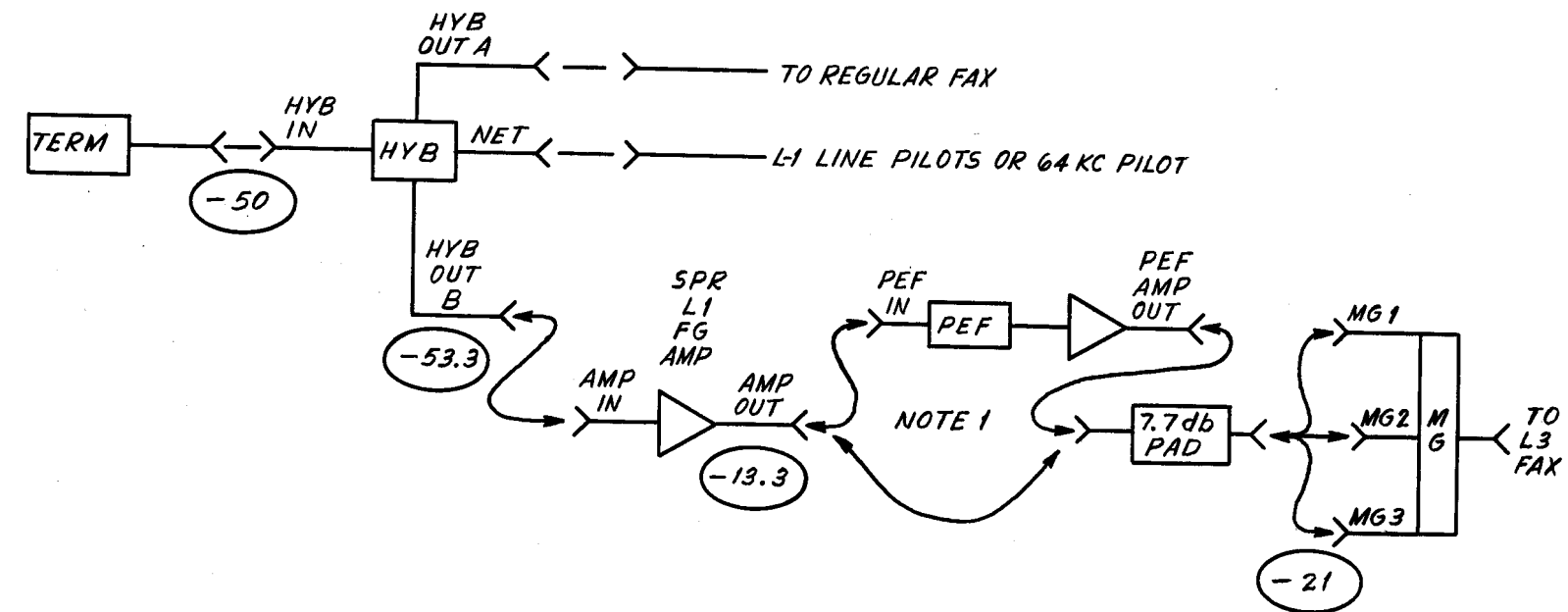
PATCHES TO MAKE GOOD L-3 TERM (TH) ON TD2 CHANNEL

SKETCH 108



PATCHES TO MAKE GOOD L-1 TERMINAL (COAX OR TD2)
ON L3 MASTER GROUPS (NOTE 3) SK109

PATCHES TO MAKE GOOD L-1 THRU OR BRANCHING
(COAX) ON L3 MASTER GROUPS (NOTE 6) SK110

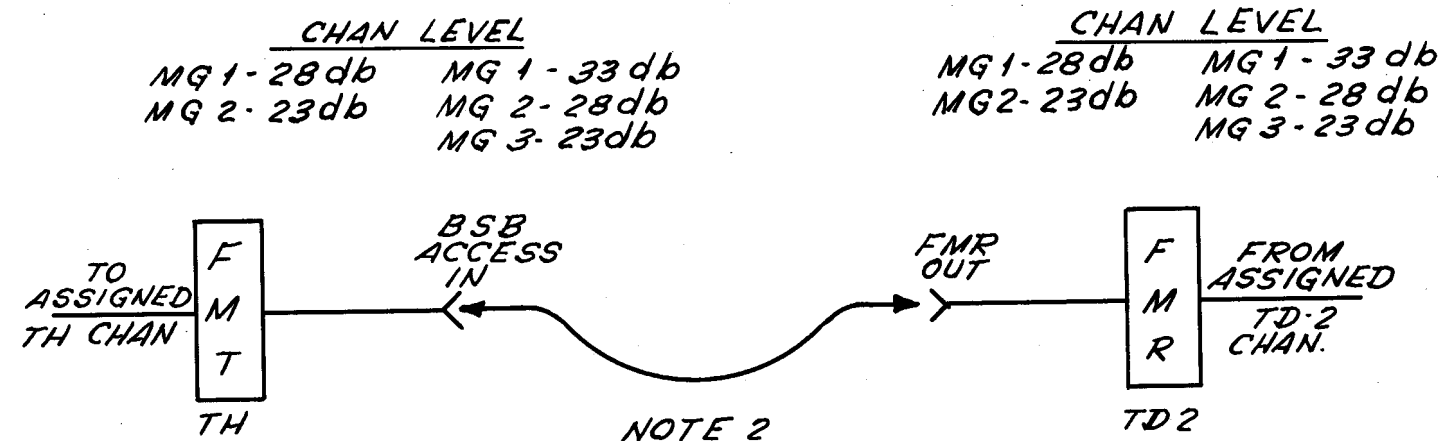
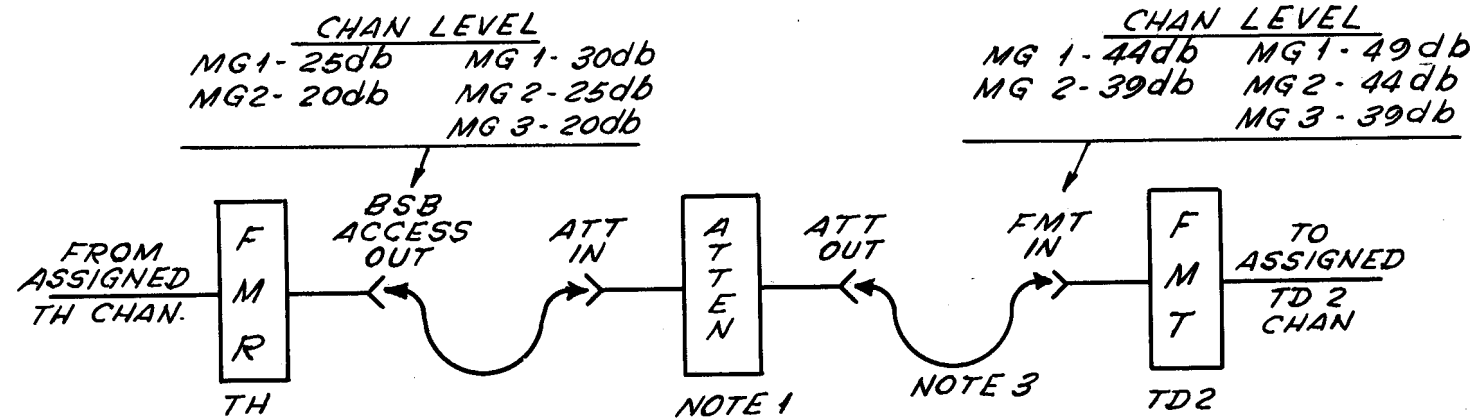


- NOTES:
1. USE PEF WHEN PATCHING TO MG1 OR 3 FROM COAX. TERMINAL.
 2. USE 4db PAD TO 5G DEM HYB IN IF SPARE F.G. AMP NOT AVAILABLE.
 3. PATCH TO MG1 KILLS 5G1
PATCH TO MG 2 OR 3 KILLS 5G1 & 2.

- NOTES:
4. USE PEF WHEN PATCHING TO MG1 OR 3.
 5. PATCH HYB NET TO SPARE L-1 LINE PILOTS.
 6. PATCH TO MG1 KILLS 5G1.
PATCH TO MG2 OR 3 KILLS 5G1 & 2.

PATCHES TO MAKE GOOD AN L3 (MORE THAN 1MG BY
INTERCONNECTING A TD-2 CHANNEL AND A
TH CHANNEL

SK 111



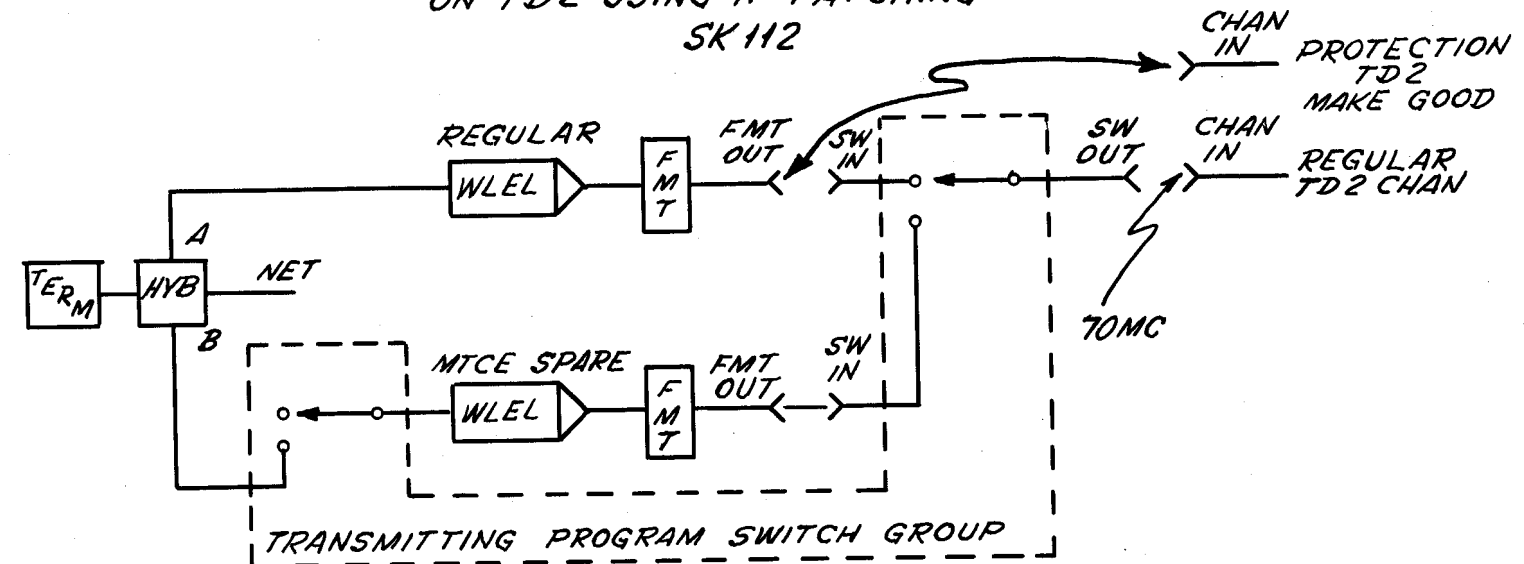
NOTE 1 - ADJUST ATTENUATOR TO OBTAIN CHAN. LEVEL - MG1 AT FMT.

NOTE 2 - ASSUMES SMALL LOSS IN TRUNK. TH CHANNEL LEVELS MAY VARY SLIGHTLY FROM VALUES INDICATED.

NOTE 3 - BY-PASS NOISE FILTER (525-R)

PATCHES TO MAKE GOOD L1 TERM OR THRU (TD2)
ON TD2 USING IF PATCHING

SK 112

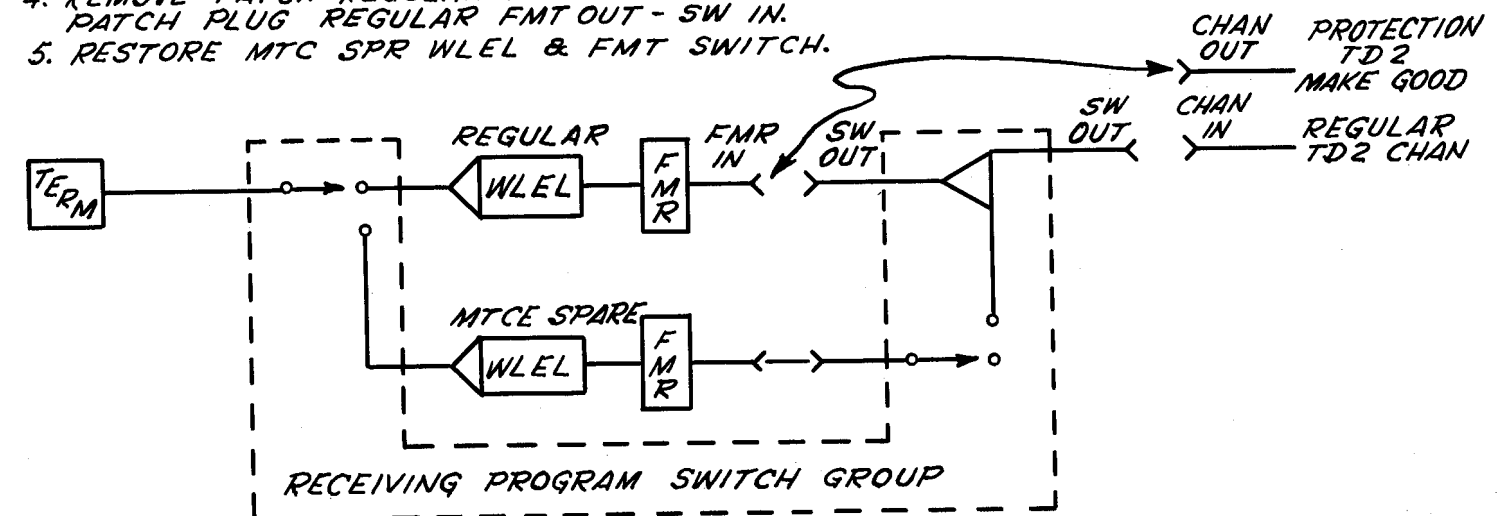


ESTABLISH

1. IF SERVICE STILL GOOD ON REGULAR FAX - SWITCH TO MTCE SPR WLEL & FMT.
2. PATCH REGULAR FMT OUT TO CHAN IN OF MAKE GOOD.
3. VERIFY CONTINUITY AND HAVE RECEIVING TERMINAL TAKE SERVICE FROM MAKE GOOD.
4. PATCH 70MC SIGNAL TO CHAN IN OF REGULAR CHANNEL.
5. RESTORE MTCE SPR WLEL & FMT SWITCH.

GO REGULAR

1. SWITCH TO MTCE SPR WLEL & FMT.
2. REMOVE 70MC AND RESTORE PATCH PLUG SW OUT - CHAN IN ON REGULAR CHAN.
3. VERIFY CONTINUITY AND HAVE RECEIVING TERMINAL TAKE SERVICE FROM REGULAR.
4. REMOVE PATCH REGULAR FMT OUT - MAKE GOOD CHAN. IN. RESTORE PATCH PLUG REGULAR FMT OUT - SW IN.
5. RESTORE MTC SPR WLEL & FMT SWITCH.



ESTABLISH

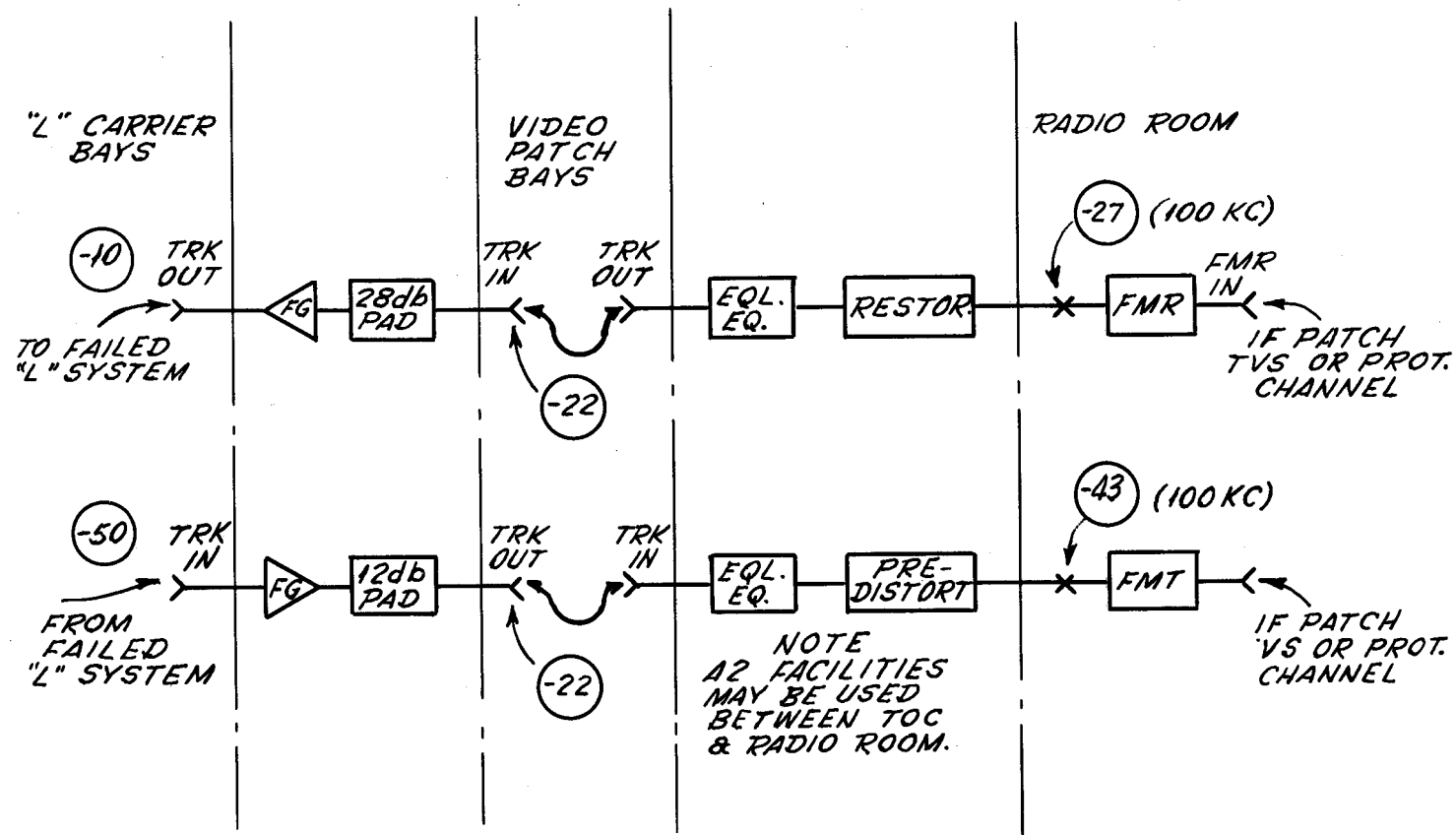
1. IF SERVICE STILL GOOD ON REGULAR - SWITCH TO MTCE SPR FMR & WLEL.
2. PATCH REGULAR FMR IN TO CHAN OUT OF MAKE GOOD.
3. VERIFY CONTINUITY AND RESTORE MTCE SPR FMR & WLEL SWITCH.

GO REGULAR

1. VERIFY REGULAR CHAN. CONTINUITY.
2. SWITCH TO MTCE SPARE FMR & WLEL.
3. REMOVE PATCH MAKE GOOD CHAN OUT - REGULAR FMR IN. RESTORE PATCH PLUG SW OUT - FMR IN.
4. RESTORE MTC SPR FMR & WLEL SWITCH.

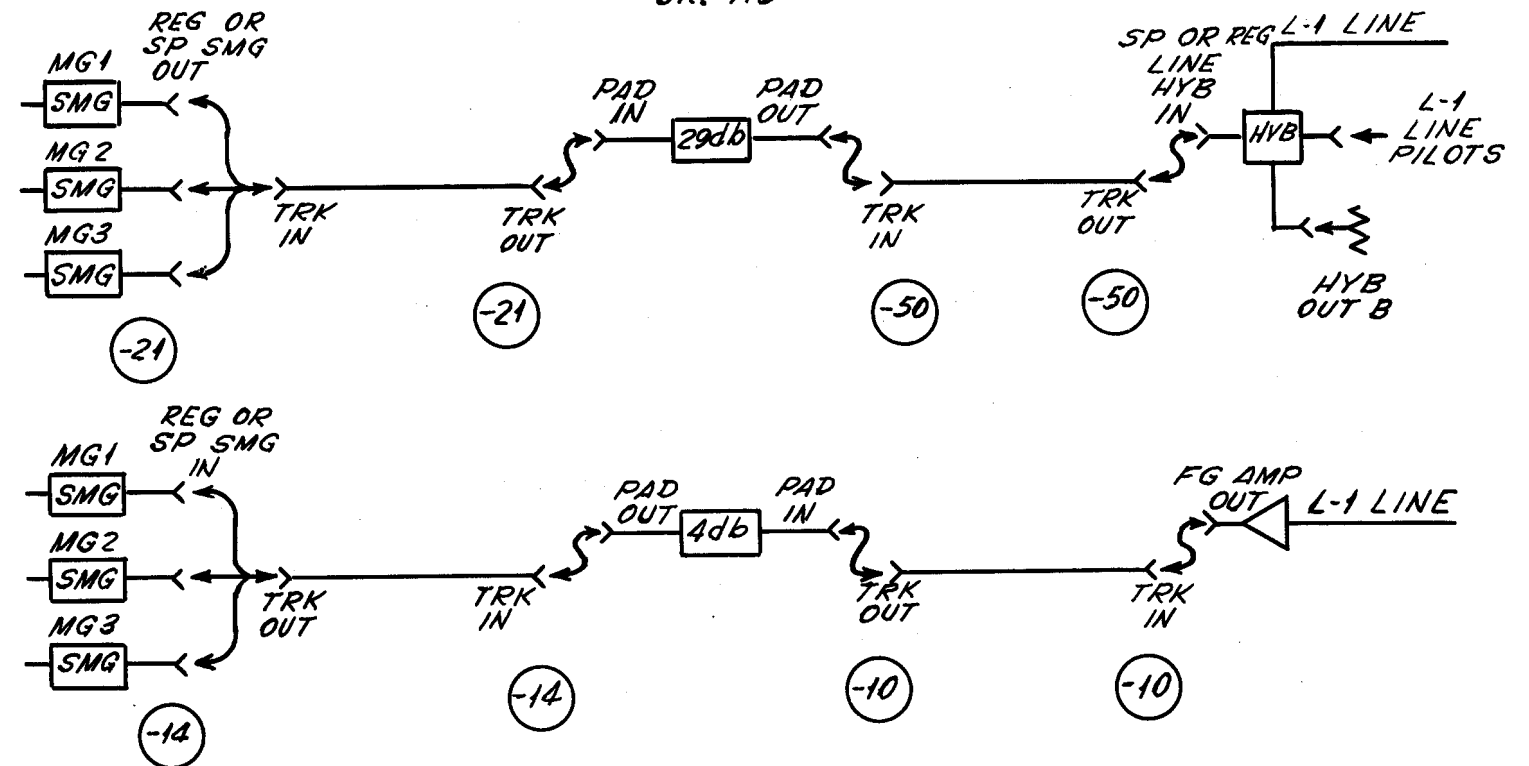
BROAD BAND L CARRIER RESTORATION METHOD USING
TV TRUNKS T.O.C. TO RADIO ROOM AS W.L.E.L.'S

SK. 113



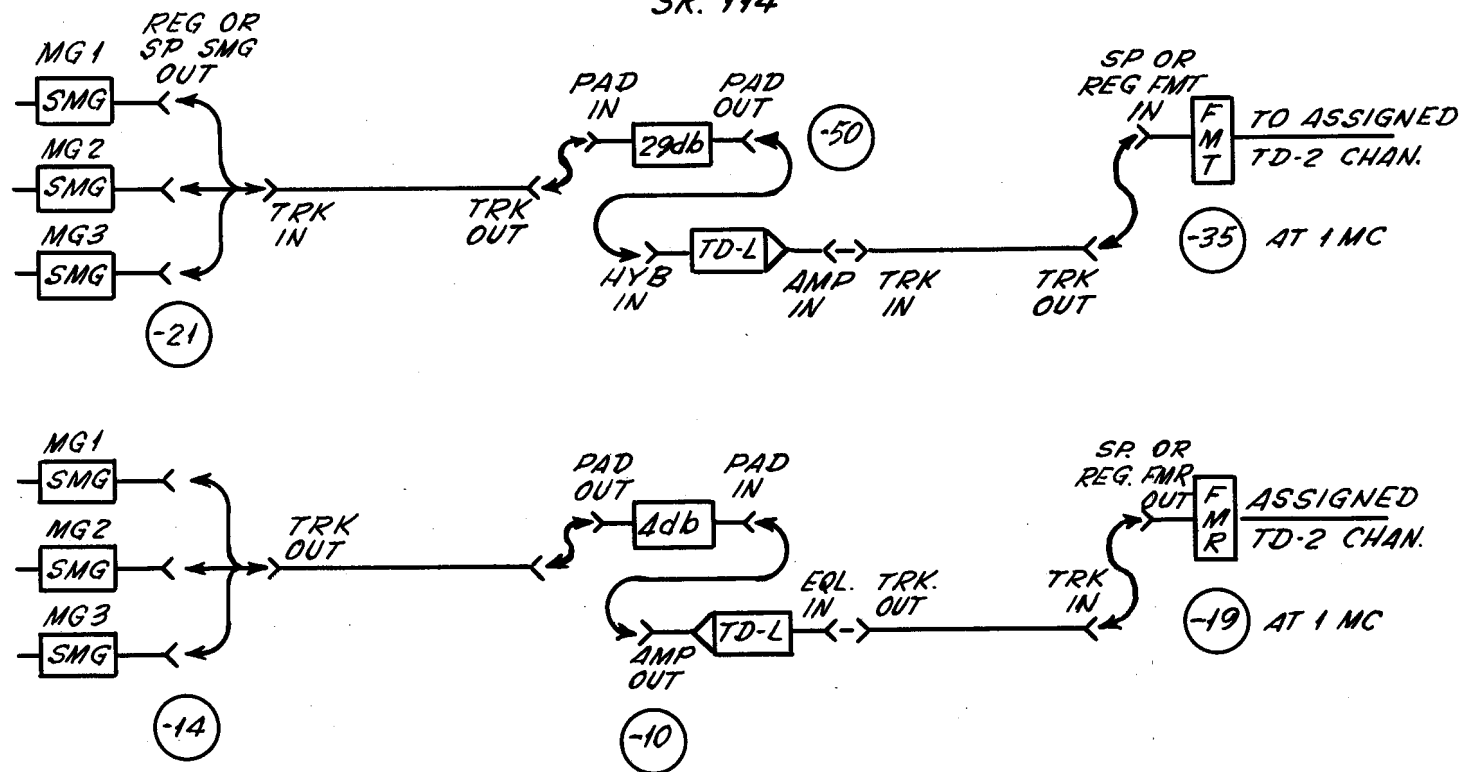
PATCHES TO MAKE GOOD ONLY L-3 (TERM.)
M.G. 1,2 OR 3 ON ONE L-1 COAX. LINE

SK. 115



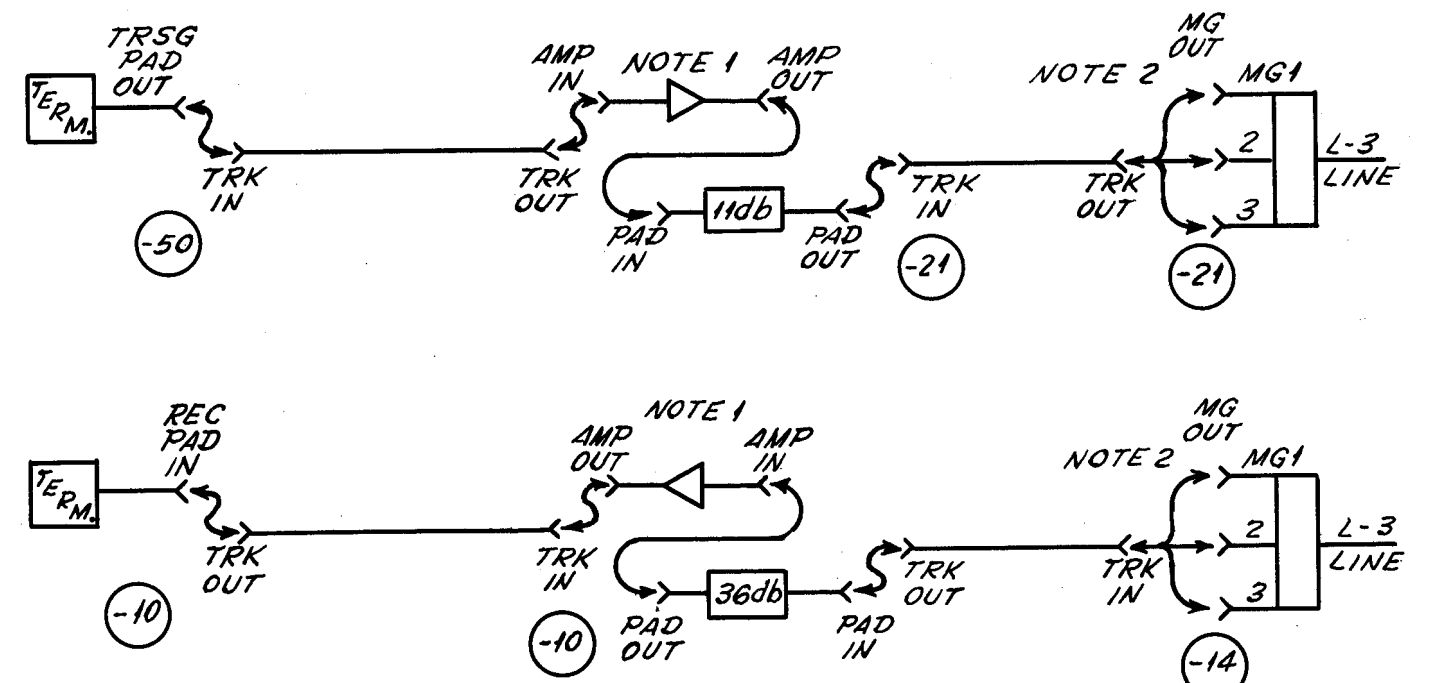
PATCHES TO MAKE GOOD ONLY ONE L-3 (TERM.)
MG. 1, 2 OR 3 ON ONE TD-2 CHANNEL

SK. 114



PATCHES TO MAKE GOOD L-1 TERM.
(COAX. OR TD-2) ON L-3 MG'S

SK. 116



NOTE 1. - USE FLAT GAIN AMPLIFIERS FROM TD-L CONN.
NOTE 2. - PATCH TO MG1 - KILLS SG1; PATCH TO MG2 OR MG3 - KILLS SG1 & SG2.