CAROT
SCHEDULING TRUNKS FOR ROUTINE TESTING

1. GENERAL

1.01 Testing Intervals and Testing Capacity—the intervals at which a trunk should be tested are determined by the transmission plant make up. In general, cable trunks are tested at monthly, repeatered trunks at biweekly, and carrier trunks at weekly or daily intervals. The test intervals for various facility test groups are given in Table 1.

1.02 In the TMF each transmission priming field contains an item giving the test group facility. Thus, a program containing Table 1 can determine the testing interval for any trunk in the TMF. This capability will be used in scheduling the tests.

1.03 It is necessary to determine the proportion of the automatic testing capacity of the CAROT needed for each ROTL office. This may be done by considering the total amount of automatic testing which must be done in each monthly (4-week) cycle. Figure 1 shows how 15 ROTL offices might be scheduled using 5 of 7 available parts for transmission testing. First, the number of trunks in each office requiring daily, weekly, biweekly, and monthly testing are written in columns, A, B, C, and D. These figures are converted to numbers of tests per month in columns D, E, F, and G, are summed to give column H, the total number of tests per office per month.

1.04 The next step is to allocate these ROTL offices to testing groups which each utilize the capacity of one port. In this example, each port is assumed able to make 800 tests/day or 16,000 tests/month. This is shown in the rightmost columns where the figures of column H are brought out for each office assigned to each group. This is easily done if the large offices are brought out first, and the smaller ones are used to fill in afterwards.

1.05 In this example, the largest office, Fra 1, exceeded the capacity of one port. If the ROTL has only one access port, it also is overloaded, and it does no good to spread Fra 1 over two testing groups. When the monthly schedule for Fra 1 is made the overload will be removed by testing daily trunks less frequently since they contribute most to the testing load. Also, each of the next three test groups given as near 16,000 tests as

possible with all spare capacity being left to group 5. Group 5 is then left with 6852 tests/month to be used on a nonroutine or discretionary basis. An alternative would be to balance the testing over the last four groups and run a shorter routine test day.

2. DRAWING UP A MONTHLY SCHEDULE

2.01 Figure 2 shows a monthly schedule for testing group 2. Although complicated in appearance, it is based on the following principle—trunks with the shortest test interval are tested first, up to the capacity of the port.

2.02 To implement this principle, daily tests are scheduled first—daily trunks 1 to 115 in Con and 1 to 454 in Fra 2 for a total of 569 daily trunks tested each and every day. Next weekly trunks are scheduled with 1 to 115 at Con and 120 weekly trunks at Fra 2 are added on the Mondays to fill out for 804 tests. The remainder of the Fra 2 weekly trunks are scheduled on Tuesdays and Wednesdays. Similarly, Con biweekly trunks are tested on the first and third Wednesday, and Fra 2 biweekly trunks are tested on the first and third Wednesday and Thursday. Monthly trunks are scheduled last. As can be seen by the totals column at the far right approximately 800 tests/day are scheduled.

2.03 Figure 3 shows the schedule for testing group 1 which was the overloaded group. In order to limit its port to 800 tests so that this port would not run late and inhibit results analysis the testing of daily trunks was cut back to roughly every other day.

2.04 Figure 4 shows testing group 5. Here the load is 460 tests per day. The spare capacity is given as 340 tests per day.

3. TROUBLE REFERRAL LOADING

3.01 The monthly schedules drawn up are the simplest for CAROT test file preparation using this method of assigning offices to testing groups. One disadvantage is, however, that the number of trunks tested in an office will vary from day to day.

For example, in testing group 2, Figure 2, on day 2 there are 115 trunks in Con and 684 trunks in Fra 2 tested. On day 5 there are 345 trunks in Con and 454 trunks in Fra 2 tested. If the number of troubles found is proportioned to the number of trunks tested, the number of troubles referred to an office will vary widely from day to day.

If this is found to be a problem for the offices, the scheduling procedure can be changed to give a constant number of trunks tested per day per office. An example of this is given in Figure 5. Each day 210 trunks in Con and 590 trunks in Fra 1 are tested. This division of testing capacity is derived from the proportion of testing capacity needed on a monthly basis. From Figure 1

$$210 = 4{,}157 \times 800/15{,}973 \text{ and}$$

$$590 = 11{,}816 \times 800/15{,}973.$$

The schedule is drawn up as before except that each office is done on an individual basis.

4. FACILITY ORDER TESTING

4.01 It is recommended that trunks which utilize carrier facilities be tested in order by facility group and channel number. A TMF tape containing carrier trunks in facility order is provided for by the TMF preparation and updating procedures. This tape should contain all carrier trunks and therefore all trunks tested at daily and weekly intervals. A TMF tape containing all trunks in traffic trunk group and traffic trunk number order is also provided for.

4.02 A convenient method of utilizing these two orders of testing is to write the daily and weekly portions of the CAROT tape from the facility order TMF and the biweekly and monthly portions from the trunk group order TMF. This has the particular advantage that on days when only daily and weekly trunks are tested in an office, only the facility

order TMF need be searched. Since the facility order TMF is typically only 20 percent of the trunk order TMF a considerable saving of time is obtained.

4.03 The method described above makes possible the orderly and timely routine automatic trunk testing within the limits of the BSP interval specifications.

TABLE 1

Test Intervals For Various Facility Test Groups

Test Interval Sect. 660-402-300		Facility Test Group Common Language Identification Sect. 005-220-101
Daily	(0)*	C, D, G, H, J, K, N, N1 OA, OB, OC, OD, ON L, R, without Group Regulation 23A, 33A, 42A, 45A, 45C, AD AC, BP, BU, CG, CN, ER, FH, GE, KE, LM, LY, MT, NE, PH, PN, RC, RY, SC
Weekly	(1)	L, R with Group Regulation N2, N3, T1, T2
Biweekly	(2)	E13, E23, E6,
	(3)	44V4, V4, 24V4
	(3)	Other VF Repeaters
Monthly	(4)	CA, OW (Non-Repeatered) All non-controlled 2 way

*Test group code—code may be used in place of Common Language Identification to indicate Test Group Facility in the CAROT TMF, 010-410-312

Offices	Trunks in Each Group				E	F	G	H	Testing Groups				
	A Daily	B Weekly	C Weekly	D Monthly	Ax20	Bx4	Cx2	D+E+F+G	1	2	3	4	5
Ant	19	19	6	372	380	76	12	840				840	
Con	115	115	68	1261	2300	460	136	4157		4157			
Cor	28	29	117	253	560	116	234	1163				1163	
Dan	51	51	82	193	1020	204	164	1581					1581
Fra 1	678	1470	-	26	13560	5880	-	19466	19466				
Fra 2	454	445	96	724	9080	1780	192	11816		11816			
Fra 3	186	637	3	220	3720	2548	6	6494			6494		
Ebm	185	185	209	1272	3600	740	418	6130			6130		
Frn	122	140	230	1070	2440	560	460	4530				4530	
Kel	52	53	290	1751	1040	212	580	3563					3563
Lak	-	-	222	894	-	-	444	1338			1338		
Lan	-	-	529	923	-	-	1058	1981			1981		
Nep	-	-	1270	1464	-	-	2540	4004					4004
Oly	71	71	400	1883	1420	284	800	4387				4387	
Tho	106	107	412	1501	2120	428	824	4873				4873	
								76323					
							Spare		-3466	27	57	207	6852
							Totals		19466	15973	15943	15793	9148

FIGURE 1 — TABLE FOR ORGANIZING TESTING GROUPS

GN-553 (12-55)

S.N.-385
(4-58)

Day	Con D	Con W	Con BW	Con M	Fra 2 D	Fra 2 W	Fra 2 BW	Fra 2 M	Tot D	Tot W	Tot BW	Tot M	T
1	1 115	1 115			1 454	1 120			569	235			804
2						121 350				230			799
3			1 68			351 445	1 70			95	138		802
4				1 210			71 96				26	210	805
5				211 440								230	799
6		1 115				1 120				235			804
7						121 350				230			799
8				441 580		351 445				95		140	804
9				581 810								230	799
10				811 1040								230	799
11		1 115				1 120				235			804
12						121 350				230			799
13			1 68			351 445	1 70			95	138		802
14				1041 1261			71 96				26	221	815
15								1 230				230	799
16		1 115				1 120				235			804
17						121 350				230			799
18						351 445		231 370		95		140	804
19								371 600				230	799
20								601 724				124	693

FIGURE 2 MONTHLY SCHEDULE FOR TESTING GROUP 2

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Day	Fra 1								Totals								
	D		W		BW		M		D	W	BW	M	T
1	1	678	1	100			1	26	678	100		26	804
2			101	800							800		800
3	1	678	801	900					678	100			778
4	1	330	901	1370					330	470			800
5	1	678	1371	1470					678	100			778
6	1	678	1	100					678	100			778
7			101	800							800		800
8	1	678	801	900					678	100			778
9	1	330	901	1370					330	470			800
10	1	678	1371	1470					678	100			778
11			SAME	AS	SECOND	WEEK							
12													
13													
14													
15													
16			SAME	AS	SECOND	WEEK							
17													
18													
19													
20													

FIGURE 3   MONTHLY SCHEDULE FOR TESTING GROUP 1

S.N.-385
(4-58)

Day	Dan D	Dan W	Dan BW	Dan M	Kel D	Kel W	Kel BW	Kel M	Nep D	Nep W	Nep BW	Nep M	Tot D	Tot W	Tot BW	Tot M	Tot T	Tot S
1	1 51	1 51	1 82		1 52	1 53	1 170						103	104	252		459	
2							171 290				1 240				360		463	
3											241 600				360		463	
4											601 960				360		463	
5				1 50							961 1270				310	50	463	
6		1 51		51 193		1 53		1 220						104	362		465	
7								221 580							360		463	
8								581 940							360		463	
9								940 1300							360		463	
10								1301 1660							360		463	
11		1 51	1 81			1 53	1 170							104	252		459	
12							171 290				1 240				360		463	
13											241 600				360		463	
14											601 900				360		463	
15								1661 1710			961 1270				310	50	463	
16		1 51				1 53		1711 1751				1 320		104	360		463	
17												321 680			360		463	
18												681 1040			360		463	
19												1040 1400			360		463	
20												1401 1464					167	

Spare Capacity 340 Tests/Day

FIGURE 4   MONTHLY SCHEDULE FOR TESTING GROUP 5

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S.N.-385
(4-58)

Day	Con D		Con W		Con BW		Con M		Con T	Fra 2 D		Fra 2 W		Fra 2 BW		Fra 2 M		Fra 2 T
1	1	115	1	95					210	1	454	1	135					589
2			96	115	1	68			203			136	270					589
3							1	95	210			271	405					589
4							96	190	210			406	445	1	96			580
5							191	285	210							1	135	589
6			1	95					210			1	135					589
7			96	115			286	360	210			136	270					589
8							361	455	210			271	405					589
9							456	550	210			406	445			136	230	589
10							551	645	210							231	365	589
11			1	95					210			1	135					589
12			96	115	1	68			203			136	270					589
13							646	740	210			271	405					589
14							741	835	210			406	445	1	96			580
15							836	930	210							366	500	589
16			1	95					210			1	135					589
17			96	115			931	1005	210			136	270					589
18							1006	1100	210			271	405					589
19							1101	1195	210			406	445			501	595	589
20							1196	1261	210							596	724	589

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FIGURE 5   ALTERNATE MONTHLY SCHEDULE FOR TESTING GROUP 2