

ENGINEERING AND OPERATING CONSIDERATIONS INVOLVED
IN FURNISHING CIRCUITS
TO THE WESTERN UNION TELEGRAPH COMPANY UNDER SPECIAL CONTRACT

1. GENERAL

1.01 This addendum to Section 312-100-000, Issue 1 is issued to include (a) Tables 1 and 2 covering additional information on circuit levels to be employed for Facsimile and Data Signals and (b) Figure 1 covering circuit interconnection arrangements. Figure 1 of the addendum replaces Figures 1A and 1B of Section III of the "Engineering Notes" attached to the main section.

1.02 This supersedes Addendum P70.500, Issue A to Section P70.500, Issue 3. Section P70.500 is renumbered 312-100-000, Issue 1.

2. TELEGRAPH AND DATA FACILITIES

2.06 Replace paragraph 2.06 with the following:

The levels for AM and FM data are included in Tables 1 and 2. These levels apply only to voice-bandwidth channels. Where channels of wider bandwidth are included, the latest information should be obtained.

3. FACILITIES FOR VOICE OPERATION

3.02 Replace paragraph 3.02 with the following:

The design of circuits used to furnish service to its customers will be the responsibility of the Telegraph Company. However, the Telephone Company should provide

the necessary information, such as facility make-up and terminating equipment capabilities to enable the Telegraph Company to carry out satisfactorily its design procedures. The Telegraph Company may request the Telephone Company to design, for a fee, any particular circuit to be used to furnish service to its customers ("WV" or "WM" circuits). In this case the service order for the Contract #2 portion of the service will indicate "TELCO to engineer." Where the Long Lines Department is the Contract #2 company, the Area Service Engineer in whose territory the Plant Control office lies is responsible for designing the overall service and for issuing a layout record card to cover. Here, the Telegraph Company should provide the necessary information, such as the customer's operational requirements, the make-up of the Contract #1 facilities and terminating equipment capabilities, to enable the Area Service Engineer to carry out satisfactorily his design procedures.

Note: This procedure should not be confused with that employed in providing circuits under Contract #3, TELPAK service. In this latter case, the Area Service Engineer arranges with the Associated Companies for the provision of local channels and station apparatus and he designs the circuits to meet the service requirements outlined in the service order. The contract #3 charges compensate for this design activity.

TABLE 1

FACSIMILE AND DATA CHANNELS
(BINARY TRANSMISSION SYSTEMS)

Recommended Channel Levels at Zero db
Level Point on Telephone Circuit

<u>Type of System</u>	<u>No. of Signal Channels per Telephone Channel</u>	<u>Maximum Signal Volts</u>		<u>Average Power of Signal dbm</u>
		<u>dbm</u>	<u>Peak-Peak</u>	
AM Facsimile	Single	-4	1.39	-10*
FM Facsimile	Single	-8	.875	- 8
AM Data	Single	-8	.875	-11
FM Data	Single	-8	.875	- 8
AM Data	N	-8**	Table 2	-11**
FM Data	N	-8**	Table 2	- 8**

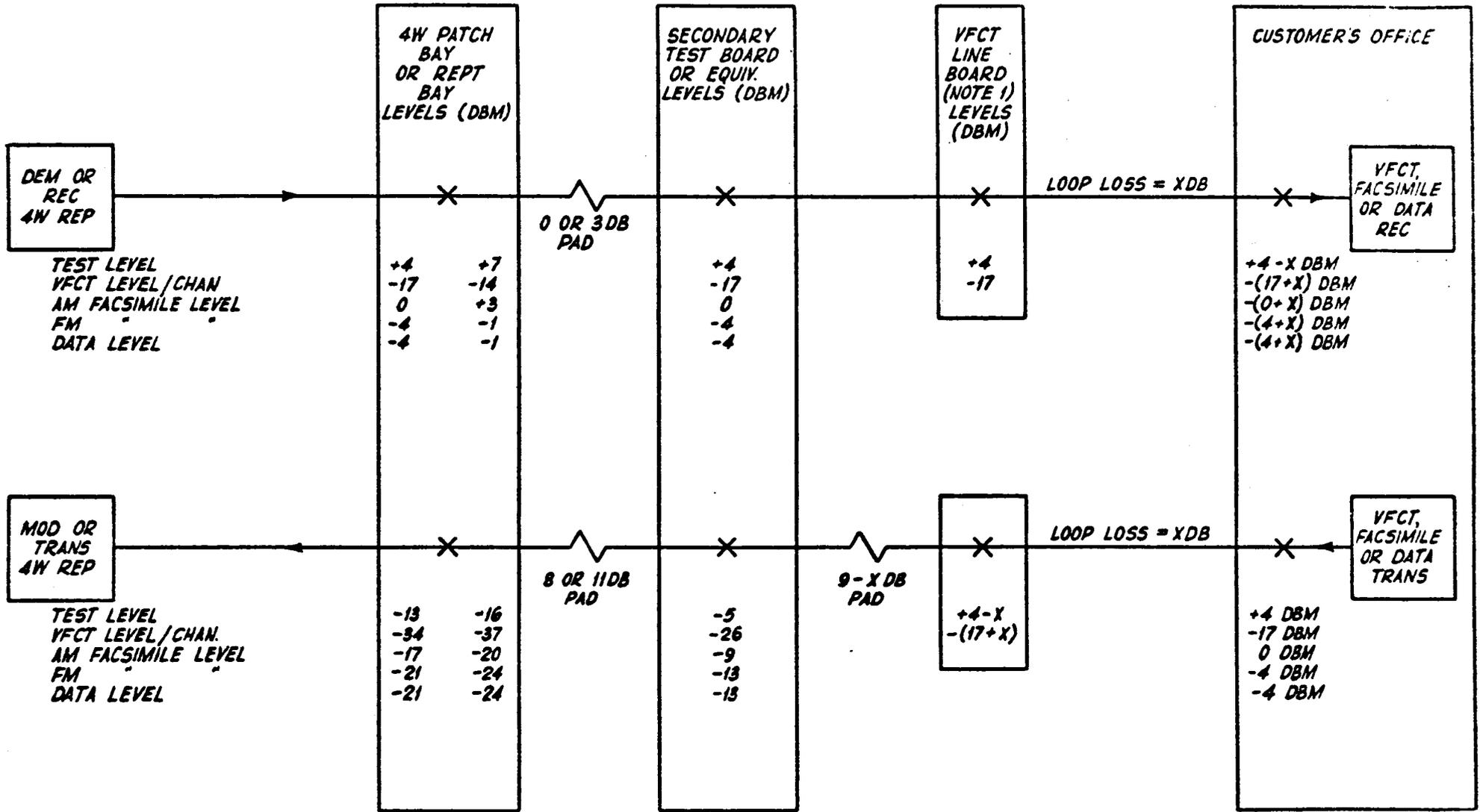
* Depends on subject. May be lower for "black maximum" and typewritten copy.

** Total power for N channels. Power per signal channel is $-(8+10 \log N)$.

TABLE 2

Relation Between Number of Signal Channels and Signal Power

<u>No. of Signal Channels (N)</u>	<u>Total Power per Telephone Channel (dbm)</u>	<u>Power per Signal Channel (dbm)</u>	<u>Peak Power per Telephone Channel</u>	
			<u>dbm</u>	<u>Volts Peak-Peak</u>
1	-8	- 8	-8	.875
2	-8	-11	-5	1.24
4	-8	-14	-2	1.75
8	-8	-17	+1	2.50
16	-8	-20	+4	3.50
N	-8	$-(8+10 \log N)$		



NOTE 1 - CIRCUIT ROUTED VIA VFCT LINE BOARD ONLY WHEN EXISTING DC TELEGRAPH LOOPS ARE USED.

FIG. 1 - INTERCONNECTING CIRCUIT AND CIRCUIT LEVELS (DBM) FOR VFCT, FACSIMILE AND DATA LAYOUTS FURNISHED TO TELEGRAPH COMPANIES