



This is only one-half of the incompleted switchboard at the time it was being installed in the War Department's new Arlington building.

World's Biggest P. B. X.

War Department's New
switchboard with its satellite
serves 20,000 telephones.

DEDICATED to war talk, the biggest PBX on earth—even bigger than any local central office in the telephone industry—recently snapped into action. It is in the War Department's new \$35,000,000 Pentagon Building in Arlington, Va., across the Potomac River from Washington, D. C.

In full operation this exchange, which will serve more than 12,000 dial telephones, will be staffed by 250 persons who will handle the 125 switchboard positions and the 36 information positions. The operators employed at the board give service on all calls from the outside and on the majority of War Department calls to outside stations. Inter-office calls, except those requiring Information service, are automatic. The PBX is connected with Washington and the long distance network reaching to points throughout the world by twelve armored submarine cables stretching across the bottom of the river.

To supplement the Pentagon switchboard, a "satellite" board, completely automatic in operation, has been set up in Washington to serve the more than 4,000 War Department telephones which will not be moved to the new building. When the entire communications system has been completed, it is estimated that the big switchboard and its smaller satellite will serve more than 20,000 telephones.

The outside plant job involved the largest number of submarine telephone cables ever laid at one time.

The twelve cables, weighing 250 tons, were manufactured on the largest cable-armoring machine ever constructed. Eleven of these voice highways carry 918 pairs of wire each, while the remaining one carries 460 pairs. These vital telephone lifelines are sheathed against the hazards of underwater service with successive protective layers of lead, jute and steel wire armoring. Wound on huge reels, the cable was transported from Baltimore down Chesapeake Bay and up the Potomac on barges equipped with special mounts.

When the heavily laden barges reached Arlington, they moved slowly cross-river, paying out the cables into pre-dredged trenches on the river bottom. A diver walked the river bed in the wake of the barges and guided the cables as they settled.

Meanwhile, within the partially completed Pentagon building itself, installers were working 'round the clock to complete the installation of the big switchboard.

In a normal installation of this type, an operator's hand can reach no more than 10,000 jacks, while the requirements of the new switchboard make it necessary for her to reach as many as 13,000 station lines, as well as 2,280 multiplied trunk lines. In order to accommodate this unusually large number of extension lines, a system for completing calls was designed as follows:



A view of the testboard and part of the frame equipment associated with telephone service in the War Department's huge new building.



Power panels associated with world's largest PBX in the War Department's new Pentagon Building. The switchboard has 125 positions.

Instead of being provided with a multiple jack for each station line, operators in the Pentagon Building are provided with 10 jacks for each 100 lines. These jacks terminate on 10 connectors which are in turn cross-connected with a 100-line group in the switching system. Thus, to complete an outside call for a War Department extension, an operator plugs an idle calling cord in the proper 100-line group and dials the last two digits of the extension number.

The telephone cables within the Pentagon Building itself

will, when completed, contain nearly 150 million feet of wire. To connect the building's switchboard with the satellite across the river calls for more than 1,500 trunk lines. Trunks and tie-lines to Long Distance, to other government departments, and to the inter-departmental switchboard connecting various government offices, require another 780 trunk lines. Bell System statisticians have figured that the wire used in these trunks runs to 364 million feet—enough to girdle the globe nearly three times.